

St. Helens Local Plan Examination

APPENDIX 7

**Response to Inspector's Matters, Issues
and Questions**

**Matter 4: Allocations, Safeguarded Land
and Green Belt Boundaries**

Persimmon Homes North West (R01145)

MAY 2021



mosaic
town planning

List of Appendices

- 1. Illustrative Masterplan – Escape**
- 2. Green Belt Assessment - LUC**
- 3. Landscape Feasibility Statement – LUC**
- 4. Ecological Statement – LUC**
- 5. Transport Issues Note – Croft/Eddisons**
- 6 a/b. Site Access Plans (Billinge Road and Garswood Road) – Croft/Eddisons**
- 7. Flood Risk Assessment / Drainage Strategy – BEK Enviro**



Weathercock Hill Farm, Garswood

Flood Risk Assessment & Drainage Strategy

April 2021

Project Information	
Project:	Weathercock Hill Farm, Garswood
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Contents

Introduction.....	1
Existing Conditions	1
Development Proposals	3
Flood Zone Classification and Policy Context	3
Consultation	5
Sources of Flooding and Probability.....	6
Mitigation	9
Surface Water Management	10
Maintenance.....	12
Foul Drainage.....	13
Conclusions.....	14
Recommendations.....	15

Appendices

Appendix A	Location Plan and Aerial Image
Appendix B	Topographical Data
Appendix C	Historical Borehole Record
Appendix D	United Utilities Sewer Plan and Correspondence
Appendix E	Indicative Development Plan
Appendix F	EA Flood Maps
Appendix G	LLFA Correspondence
Appendix H	REFH2 Greenfield Runoff Rates
Appendix I	MicroDrainage Simulation
Appendix J	SuDS Maintenance Schedules
Appendix K	CDRA

Introduction

Waterco has been commissioned to undertake a Flood Risk Assessment and Drainage Strategy in relation to a proposed residential development at Weathercock Hill Farm, Billinge Road, Garswood, St. Helens, WN4 0SP.

The purpose of this report is to outline the potential flood risk to the site, the impact of the proposed development on flood risk elsewhere, and the proposed measures which could be incorporated to mitigate the identified risk. This report has been prepared in accordance with the guidance contained in the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG): Flood Risk and Coastal Change.

As Lead Local Flood Authority (LLFA), St Helens Council is a statutory consultee for major planning applications in relation to surface water drainage, requiring that all planning applications are accompanied by a Sustainable Drainage Strategy. The aim of the Sustainable Drainage Strategy is to identify water management measures, including Sustainable Drainage Systems (SuDS), to provide surface water runoff reduction and treatment.

Existing Conditions

The site covers an area of approximately 10.02 hectares (ha) and is located at National Grid Reference (NGR): 355150, 399960. A location plan and an aerial image are included in Appendix A.

Online mapping (including Google Maps / Google Streetview imagery, accessed April 2021) shows that the site comprises agricultural land. The site is bordered by Billinge Road to the north, Smock Lane to the east, residential properties to the south, and Garswood Road and residential properties to the west. Access to the site is provided from Garswood Road.

Local Topography

A topographical survey has been undertaken by RJP Surveying Consultants Ltd in April 2021. The topographical survey shows that the site slopes from 91.57m Above Ordnance Datum (m AOD) in the north-west to 82.31m AOD in the north-east.

Topographic levels to m AOD have also been derived from a 1m resolution Environment Agency (EA) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). The LiDAR data corroborates with the topographic survey and confirms that the site generally slopes from north-west to east.

Topographical data is included in Appendix B.

Ground Conditions

Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the north-western extent of the site is underlain by superficial deposits of Devensian Till, generally comprising diamicton. There are no superficial deposits recorded in the south-eastern extent of the site.

The majority of the site is underlain by the Pennine Lower Coal Measures Formation, consisting of Mudstone. A limited area in the southern extent of the site is underlain by Trencherbone Rock, generally consisting of Sandstone.

The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a site-specific basis.

The closest historical BGS borehole record is located approximately 125m west of the site within the Pennine Lower Coal Measures (BGS reference SD50SW193) and is included in Appendix C. The cable percussive exploratory hole was advanced to a depth of 9 metres below ground level (m bgl). The borehole identified Made Ground up to a depth of 0.4m.bgl underlain by sandy brown clay, grey-black sandy clay, gravel and orange sand to 8.7m.bgl. The Pennine Lower Coal Measures Formation was encountered towards the base of the borehole at 8.7m.bgl. Groundwater was struck at a depth of 5.80m.bgl rising to 3.50m.bgl within 30 minutes.

According to the EA's Aquifer Designation data, obtained from MAGIC's online mapping [accessed April 2021], the superficial deposits are classified as a Secondary Undifferentiated Aquifer. Secondary Undifferentiated Aquifers are assigned in '*cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type*'.

The underlying Pennine Lower Coal Measures Formation is described as a Secondary A Aquifer. Secondary A Aquifers are '*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers*'.

The EA's 'Source Protection Zones' data, obtained from MAGIC's online mapping [accessed April 2021], indicates that the site is not located within a Groundwater Source Protection Zone.

The Cranfield University 'Soilscapes' map [accessed April 2021] indicates that the site is underlain by '*Slowly permeable seasonally wet... loamy and clayey soils*'.

Local Drainage

Public sewer records have been obtained from United Utilities (UU) and are included in Appendix D. The UU sewer records show that there is a 225mm public surface water sewer located in Smock Lane. The surface water sewer flows both north and south from a high point in Smock Lane. Public surface water manhole 1605, located to the south of the site, has a cover level of 85.06m AOD and an invert level of 82.67m AOD. Public surface water manhole 3902, located immediately east of the site, has a cover level of 82.30m AOD and an invert level of 80.40m AOD.

The UU sewer records also show that there is a 225mm public combined sewer located in Garswood Road flowing south-east. No cover or invert levels are provided. There is also a 100mm / 150mm public foul sewer located 40m east of the site flowing north within residential gardens.

Development Proposals

The proposed development is for approximately 258 residential properties with associated gardens and driveways, together with new access roads and landscaping. This report has been prepared to support the development of the final Masterplan. The indicative development plan, which is subject to change, is included in Appendix E.

The proposed development will introduce approximately 30,720m² of hardstanding, or 31% of the total site area, in the form of dwellings, driveways and access roads. The remaining 69,480m², or 69% of the total site area, will be occupied by soft landscaped areas.

Measurements have been taken from a .dwg version of the Viability Layout (drawing BRG/SDA/01) and are approximate only.

Flood Zone Classification and Policy Context

The EA 'Flood Map for Planning', included in Appendix F, shows that the site is located within Flood Zone 1 - an area outside of the extreme flood extent, considered to have a less than 0.1% annual probability of flooding from rivers or the sea.

In accordance with Table 2 of the NPPG: Flood Risk and Coastal Change, residential development is classified as 'more vulnerable'. Table 3 of the NPPG states that 'more vulnerable' development is considered appropriate within Flood Zone 1. The development therefore passes the flood risk Sequential Test and the Exception Test does not need to be applied.

Local Policy

The 'St. Helens Local Plan Core Strategy' (October 2012) is the existing principal planning framework for St. Helens Council. However, the St Helens Local Plan Core strategy contains no policies directly relating to flood risk.

The 'St. Helens Borough Local Plan 2020- 2035 Submission Draft' has recently been reviewed by the public, updated accordingly and submitted to the Planning Inspectorate for independent examination; it contains the following policy relating to flood risk and drainage:

'Policy LPC12: Flood Risk and Water Management Flood Risk

1. Any development proposal that may either be at risk of flooding or cause a material increase in flood risk elsewhere will only be permitted if the flooding issues have been fully assessed and any identified risks would be appropriately mitigated. Any assessment and mitigation should have regard to:

a) the St. Helens Strategic Flood Risk Assessment;

b) advice and guidance from relevant bodies including the Environment Agency and Lead Local Flood Authority; and

c) any relevant Surface Water Management Plan or local drainage strategy such as the Sankey Catchment Action Plan, Mersey Estuary Catchment Flood Management Plan or the North West River Basin Management Plan.

2. All development proposals must be supported by a Flood Risk Assessment appropriate to their nature and scale where they would be:

a) within flood zones 2 or 3; or

b) on a site of 1 hectare or larger within flood zone 1; or

c) on a site of 0.5 hectare or larger within a Critical Drainage Area; or

d) in any area identified by the Council as being at intermediate or high risk of surface water flooding.

3. New development should be located in accordance with a sequential approach as set out in national policy. Development on sites located in flood zones 2 or 3 will only be allowed if:

a) the Sequential Test has been applied and demonstrates that the development cannot reasonably be accommodated within an area at lower risk of flooding;

b) any applicable Exception Test required by national policy has been passed; and

c) appropriate mitigation or adaption measures are proposed to satisfactorily reduce the likelihood or impact of flooding.

4. Measures to manage or mitigate flood risk associated with or caused by new development must (as appropriate having regard to its scale and nature):

a) be designed to contribute to the biodiversity of the Borough unless it has been demonstrated that this would not be technically feasible;

b) protect heritage assets (such as buried archaeology);

c) be fully described in the development proposal; and

d) be funded by the developer, including long-term maintenance.

5. Any proposal for major development on a site that would abut, run alongside or straddle any watercourse in the Borough, must include measures to temporarily attenuate and filter flood water in order to: improve water quality; reduce peak flows during flooding; and reduce downstream flood risk, unless it has been demonstrated that this is not feasible or viable. In cases where measures are not currently feasible or viable, the development must not compromise the ability to implement such measures in the future.

6. The Flood Water Storage Safeguarding Areas as defined on the Policies Map shall be safeguarded for the provision of flood storage. Development within or adjacent to these areas that would have a negative impact

on their function as a flood storage area or on their potential to be developed for flood storage infrastructure will not be permitted.'

Local guidance documents including the St. Helens Council Strategic Flood Risk Assessment (SFRA) (April 2013), the St. Helens Council Preliminary Flood Risk Assessment (PFRA) (2017-2023), and the St Helens Sustainable Drainage Systems (SuDS) 2018 Design and Technical Guidance have been reviewed and inform this report.

Consultation

A consultation request was submitted to the LLFA in March 2021. A response is included within Appendix G. The LLFA have stated that:

'At this stage of the development and level of information, I am unable to provide formal comment on the layout or proposed drainage method. I am able to provide generic advice and guidance for the development along with answers to a few of your queries.'

In terms of flood risk, there has been surface water runoff flooding from the farmland onto the highway Smock Lane (near the junction of Smock Lane and Billinge Road B5207), this is representative of the EA surface water flood risk mapping (30, 100, 1000 year return period).

St Helens Council have our own SuDS Guidance that is available in the link below. The files include the main guidance and local standards, a separate checklist for developers which needs to be submitted with each application, and a surface water runoff calculator. The runoff calculator is currently not available as it is going through technical updates. The full SuDS hierarchy will have to be followed for this development.

The NPPF climate change figures have now been superseded with higher values (40% is Council planning baseline) as shown in the government report (19th February 2019) and we will expect to see the surface water discharge rate to be set to Greenfield runoff for the development. The site catchment discharge must follow where possible the natural drainage paths / location.'

A Consultation request was submitted to United Utilities in March 2021. In their response (Appendix D), UU have stated that:

'Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system. The foul connection point is required to be assessed further and has now been referred to our asset management team.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore,

please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

- 1. into the ground (infiltration);*
- 2. to a surface waterbody;*
- 3. to a surface water sewer or highway drain;*
- 4. to a combined sewer.*

.....

Existing Water Assets Crossing the Site

The Rivington Aqueduct crosses your site please refer to the information below for your consideration.

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website.'

Further correspondence has been submitted to UU and the LLFA regarding a potential surface water connection to the public surface water sewer in Smock Lane.

Sources of Flooding and Probability

Fluvial

The nearest watercourse is Down Brook which is located approximately 325m north of the site. Down Brook flows east in this location. There are no other watercourses in the immediate vicinity of the site.

The site is located within Flood Zone 1 on the EA's 'Flood Map for Planning' (Appendix F) meaning it has less than 0.1% annual probability of flooding from rivers and the sea.

The EA 'Historical Flood Map' (included in Appendix F) indicates that there are no historical records of flooding at or within the immediate vicinity of the site.

The site is situated approximately 5m above Down Brook and as such any potential flooding from this watercourse would not affect the site.

The risk of fluvial flooding is therefore considered to be very low.

Tidal

The site is situated at a minimum of approximately 82.30m AOD and is significantly above sea level. Therefore, the risk of tidal flooding is very low.

Surface Water

Surface water flooding occurs when rainwater does not drain away through the normal drainage system or soak into the ground. It is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen or developed, resulting in overland flow and ponding in depressions in topography. Surface water flooding can occur anywhere without warning. However, flow paths can be determined by consideration of contours and relative levels.

The EA 'Flood Risk from Surface Water' map (Appendix F) indicates that the majority of the site is shown at very low risk of surface water flooding, meaning it has a less than 0.1% annual probability of flooding. The EA mapping identifies a surface water flow route crossing the centre of the site from west to east, and an area of surface water ponding in the lower north-eastern extent of the site. The north-eastern extent of the site, where surface water ponding is identified by EA mapping, is shown to have a high risk of flooding, with a greater than 3.3% annual probability of occurrence.

The flooding mechanism at the site is such that during the high (greater than 3.3% annual probability) and medium (between a 1% and 3.3% annual probability) events, surface water flooding is generated on site and is associated with surface water ponding within topographical low points. A flood flow route generates to the west of the site during the high and medium risk events, however flows are contained within and directed south along Garswood Road, proceeding onto agricultural land south-west of the site.

During a low risk event (between a 1% and 0.1% annual probability), surface water flooding on Garswood Road reaches a sufficient height to enter the site, resulting in a flood flow route forming from west to east through the centre of the site. The additional flows entering the site during the low risk event result in an increased extent of surface water ponding in the lower north-eastern extent of the site.

The LLFA have records of surface water flooding affecting the north-eastern extent of the site and Smock Lane adjacent to the site. The LLFA have stated that: *'In terms of flood risk, there has been surface water runoff flooding from the farmland onto the highway Smock Lane (near the junction of Smock Lane and Billinge Road B5207), this is representative of the EA surface water flood risk mapping (30, 100, 1000 year return period).'*

It can therefore be concluded that the north-eastern extent of the site is at potential risk of surface water

flooding with a greater than 3.3% annual probability. The flood extent is increased during a low risk event whereby a flood flow route crosses the site from west to east. The flood flow route is derived from Garswood Road and agricultural land beyond to the west.

Sewer

Flooding from sewers can occur when a sewer is overwhelmed by heavy rainfall, becomes blocked, is damaged, or is of inadequate capacity. Flooding is mostly applicable to combined and surface water sewers.

As stated above, there is a 225mm surface water sewer located in Smock Lane. There is also a 225mm public combined sewer located within Garswood Road.

Any potential flooding from the 225mm surface water sewer in Smock Lane would be directed north-east, away from the site, following the topography of the road. Any potential flooding from the 225mm public combined sewer in Garswood would be directed south, away from the site, following the local topography.

There are no records of sewer flooding affecting the site. The risk of sewer flooding is therefore considered to be low.

Groundwater

Groundwater flooding occurs when water levels underneath the ground rise above normal levels. Prolonged heavy rainfall soaks into the ground and can cause the ground to become saturated. This results in rising groundwater levels which leads to flooding above ground.

The PFRA states that *'there are known locations with high groundwater within St Helens however, there are no specific records or reported incidents of groundwater flooding. Therefore, it is considered currently that there are no groundwater flood incidents that would result in 'significant harmful consequences' as defined by the PFRA threshold.'*

The majority of the site is underlain by superficial deposits of Devensian Till, generally comprising diamicton. The impermeable nature of the superficial deposits will limit the vertical migration of groundwater.

There are no records of groundwater flooding at or near to the site. It can therefore be concluded that the risk of groundwater flooding is low.

Artificial Sources

There are no canals within the vicinity of the site. The EA 'Flood Risk from Reservoirs' map (Appendix F) shows that the site is not at risk of flooding from reservoirs.

It can therefore be concluded that the risk of flooding from artificial sources is very low.

Summary of Potential Flooding

It can be concluded that surface water flooding is the main potential source of flood risk at this site. The associated risk should inform the site layout.

Mitigation

Taking a sequential approach to flood risk, and in order to ensure the development does not increase flood risk elsewhere through impacting on surface water flood flow routes, or removing flood storage, no development (including buildings and private gardens) should be located within the surface water flood extent shown on the EA 'Flood Risk from Surface Water Map' (Appendix F), reproduced in Figure 1 below.

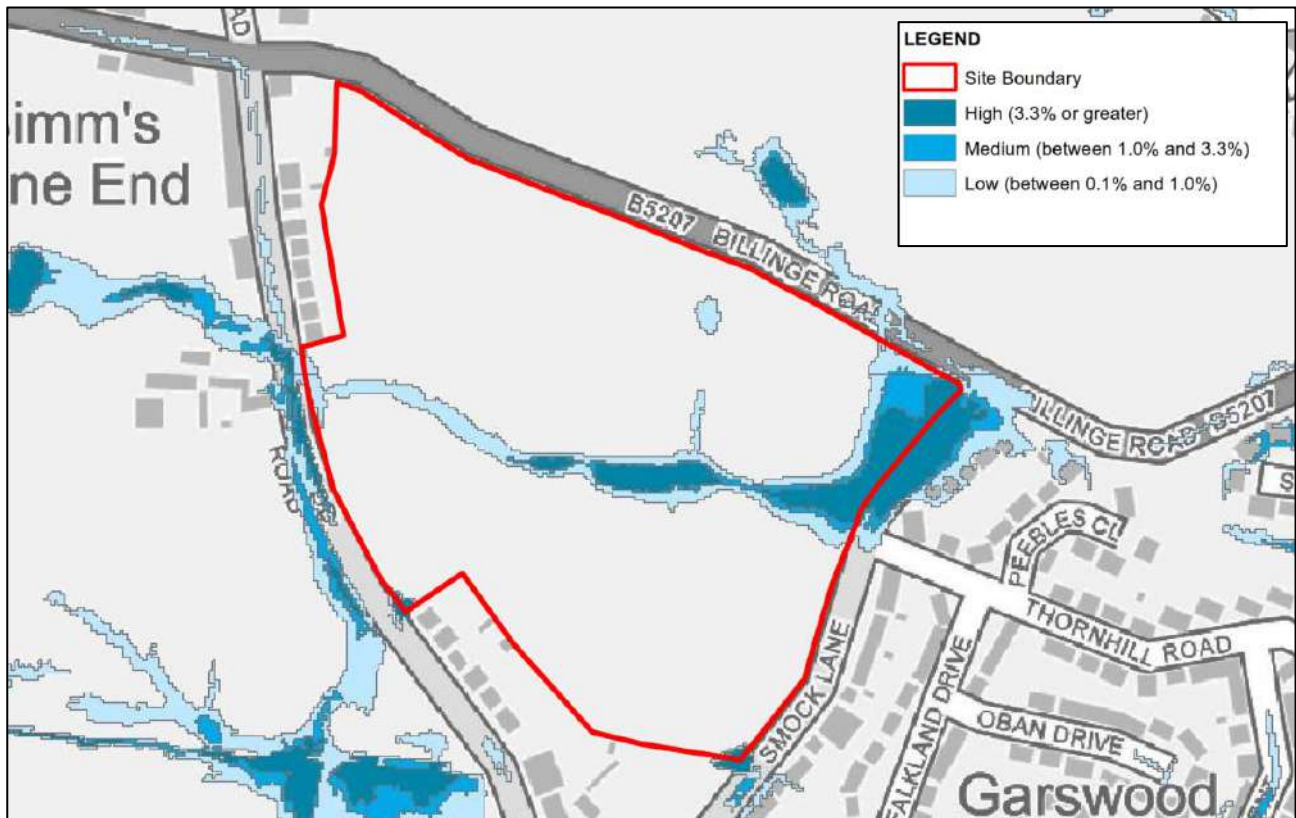


Figure 1 – EA Flood Risk from Surface Water

The land shown within the surface water flood extent should be designated as public open space as to maintain flood flow routes. However, it is acknowledged that access roads will need to cross through the surface water flood extent. Where access roads cross the flood extent, consideration should be made at the detailed design stage to either ensure site levels within the flood flow route are not altered, or provision is made for culverts beneath access roads which cross the flood extent.

Finished floor levels should be set 150mm above surrounding ground levels in accordance with Building Regulations.

Surface Water Management

The proposed development will introduce approximately 30,720m² of hardstanding, or 31% of the total site area, in the form of dwellings, driveways and access roads. The remaining 69,480m² or 69% of the total site area will be occupied by soft landscaped areas.

The introduction of hardstanding area will result in an increase in surface water runoff rates and volumes. In order to ensure the proposed development will not increase flood risk elsewhere, surface water discharge from the site will be controlled.

The existing greenfield runoff rates have been estimated using the Revitalised Flood Hydrograph Model (ReFH2) method. A summary of the greenfield runoff rates for a range of events is provided as Appendix H. The existing 1 in 1 year greenfield runoff rate for the 10.02ha development site is 61.4 l/s.

A discharge rate of 61.4 l/s is proposed for this site subject to agreement with the LLFA and UU.

Attenuation Storage

In order to achieve a discharge rate of 61.4 l/s, attenuation storage will be required. An attenuation storage estimate has been undertaken using MicroDrainage and is included in Appendix I. An estimated storage volume of 1,694m³ will be required to accommodate the 1 in 100 year plus 40% Climate Change (CC) event. The storage estimate is based on storage within a tank or pond structure, a 1m design head and hydro-brake flow control. An impermeable drainage area of 33,790m² has been applied accounting for a 10% allowance for urban creep in accordance with Table 6a of the St Helens Sustainable Drainage Systems (SuDS) 2018 Design and Technical Guidance.

Discharge Method

Paragraph 080 of the NPPG: Flood Risk and Coastal Change sets out the following hierarchy of drainage options: into the ground (infiltration); to a surface water body; to a surface water sewer, highway drain or another drainage system; to a combined sewer.

Infiltration

The first consideration for the disposal of surface water is infiltration (soakaways and permeable surfaces).

The site is underlain by Devensian Till, generally comprising diamicton. There are no superficial deposits recorded in the south-eastern extent of the site. Given the likely impermeable nature of the superficial deposits recorded across the majority of the site, infiltration techniques may not be feasible.

Infiltration tests should be undertaken in accordance with the BRE365 specification to determine the suitability of infiltration techniques.

Watercourse

Where infiltration techniques are not suitable, a connection to watercourse is the next consideration. There are no watercourses within the immediate vicinity of the site. A connection to Down Brook 325m north of the site would require crossing through 3rd party urbanised land and is not considered a feasible option.

Sewer

As disposal of surface water to watercourse is not feasible, a connection to the public sewer system is the final consideration. There is a 225mm public surface water sewer located in Smock Lane. Surface water manhole 3902 located immediately east of the site in Smock Lane has an identified cover level of 82.30m AOD and an invert level of 80.4m AOD. The minimum site level is 82.31m, therefore, a gravity connection to this sewer appears to be a feasible option. A provisional discharge rate of 61.4 l/s (1 in 1 year runoff rate) is proposed subject to agreement with UU and the LLFA.

Sustainable Drainage Systems

Attenuation storage should be provided in the form of SuDS. Provision should be made within the layout for SuDS such as an attenuation pond located within the lower north-eastern extent of the site, facilitating gravity drainage. However, SuDS should be located outside of the surface water flood extent.

Where possible, provision should also be made for surface water conveyance features such as swales together with permeable paving for private driveways.

Concept Surface Water Drainage Scheme

Surface water runoff will be discharged to the 225mm public surface water sewer located in Smock Lane at the 1 in 1 year greenfield runoff rate of 61.4 l/s subject to agreement with UU and the LLFA. A gravity connection can be achieved.

Surface water runoff up to the 1 in 100 year plus 40% climate change allowance event will be attenuated on site. Provision should be made for an attenuation pond in the lower north-eastern extent of the site (however, outside of the surface water flood extent). A provisional attenuation volume of 1,694m³ will be required to achieve the discharge rate. Where possible, provision should also be made for surface water conveyance features such as swales in order to provide sufficient treatment to runoff from access roads.

Exceedance Event

Storage will be provided for the 1 in 100 year plus 40% CC event. Storm events in excess of the 1 in 100 year plus 40% CC event should be permitted to produce temporary shallow depth flooding within the access roads and landscaped areas. Finished floor levels should be set at a minimum of 150mm above surrounding ground levels ensuring exceedance flooding will not affect the buildings.

Surface Water Treatment

In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), residential roofs have a 'very low' pollution hazard level, with roads with greater than 300 traffic movements per day classified as having a 'medium' pollution hazard level. Table 2 shows the pollution hazard indices for each land use.

Table 1 – Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Roads	Medium	0.7	0.6	0.7

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.2

* Indices values range from 0-1.

Where practical, runoff from roofs and roads will be directed to an attenuation pond. There is also potential for the use of swales, and permeable paving for driveways. Table 3 shows the pollution mitigation offered by ponds, swales and permeable paving.

Table 2 – SuDS Mitigation Indices

Type of SuDS	Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Ponds	0.7	0.7	0.5
Swales	0.5	0.6	0.6
Permeable paving	0.7	0.6	0.7

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.3

As shown in Tables 2 and 3, a pond in isolation will not offer sufficient treatment for hydrocarbons from roads with greater than 300 traffic movements per day. In order to ensure sufficient treatment is provided for runoff from roads, swales should be used in conjunction with a pond, or a suitably sized separator or filtration unit should be placed upstream of the pond.

Maintenance

Communal drainage features such as ponds and swales can be offered for adoption to United Utilities who will then be responsible for maintenance. Alternatively, maintenance of shared surface water drainage systems can be arranged through appointment of a site management company.

Maintenance schedules for ponds, swales and permeable paving are included in Appendix J.

Foul Drainage

The UU sewer records show that there is a 225mm public combined sewer located within Garswood Road. The cover and invert levels are not available. However, based on site levels, a pumped solution to the combined sewer in Garswood Road would be required from the lower eastern extent of the site. There is also a 150mm public foul sewer approximately 40m east of the site flowing north-east within property gardens. The sewer crosses through an area of public open space approximately 40m north-east of the site. Public foul manhole 4902 is located within the area of public open space and could form a point of gravity connection from the development.

UU have stated that *'the foul point of connection is required to be assessed further and has now been referred to our asset management team'*. UU have been consulted to provide further comment.

A gravity solution for foul flows from the development is available subject to UU agreement on connection points.

Conclusions

The proposed development is for approximately 258 residential properties with associated gardens and driveways, together with access roads and landscaping. This report has been prepared to support the development of the final Masterplan.

The site is located within Flood Zone 1 on the Environment Agency (EA) 'Flood Map for' – an area considered to have the lowest probability of fluvial and tidal flooding. The site is shown to be located outside of the extreme 0.1% annual probability fluvial flood extent.

The risk of flooding from all sources has been assessed. The north-eastern extent of the site is identified at risk of surface water flooding during a 'high risk' (greater than 3.3% annual probability) event. A surface water flood flow route crosses from west to east through the centre of the site during a 'low risk' (between a 1% and 0.1% annual probability) event.

Taking a sequential approach, no development (dwellings or gardens) should be located within the surface water flood extent identified by the EA 'Flood Risk from Surface Water' map. The extent of internal access roads within the flood extent should be minimised.

The proposed development will introduce impermeable drainage area in the form of buildings and access roads. This will result in an increase in surface water runoff. In order to ensure the increase in surface water runoff will not increase flood risk elsewhere, flow control will be used and attenuation provided on site to accommodate storm events up to and including the 1 in 100 year plus 40% climate change event.

All methods of surface water discharge have been assessed. Where infiltration is not feasible, a connection to the 225mm public surface water sewer in Smock Lane will be required. A gravity connection can be achieved. A provisional discharge rate of 61.4 l/s (1 in 1 year runoff rate) is proposed however is subject to agreement with UU and the LLFA.

Attenuation will be required in order to achieve a limited discharge rate. Provision should be made within the final site layout for an attenuation pond within the lower north-eastern extent of the site. However, the attenuation pond should be positioned outside of the surface water flood extent. A provisional attenuation volume of 1,694m³ will be required to accommodate the 1 in 100 year plus 40% CC event.

Where possible, provision should also be made for surface water conveyance features such as swales in order to provide sufficient treatment to runoff from access roads. Permeable paving should also be considered for private driveways.

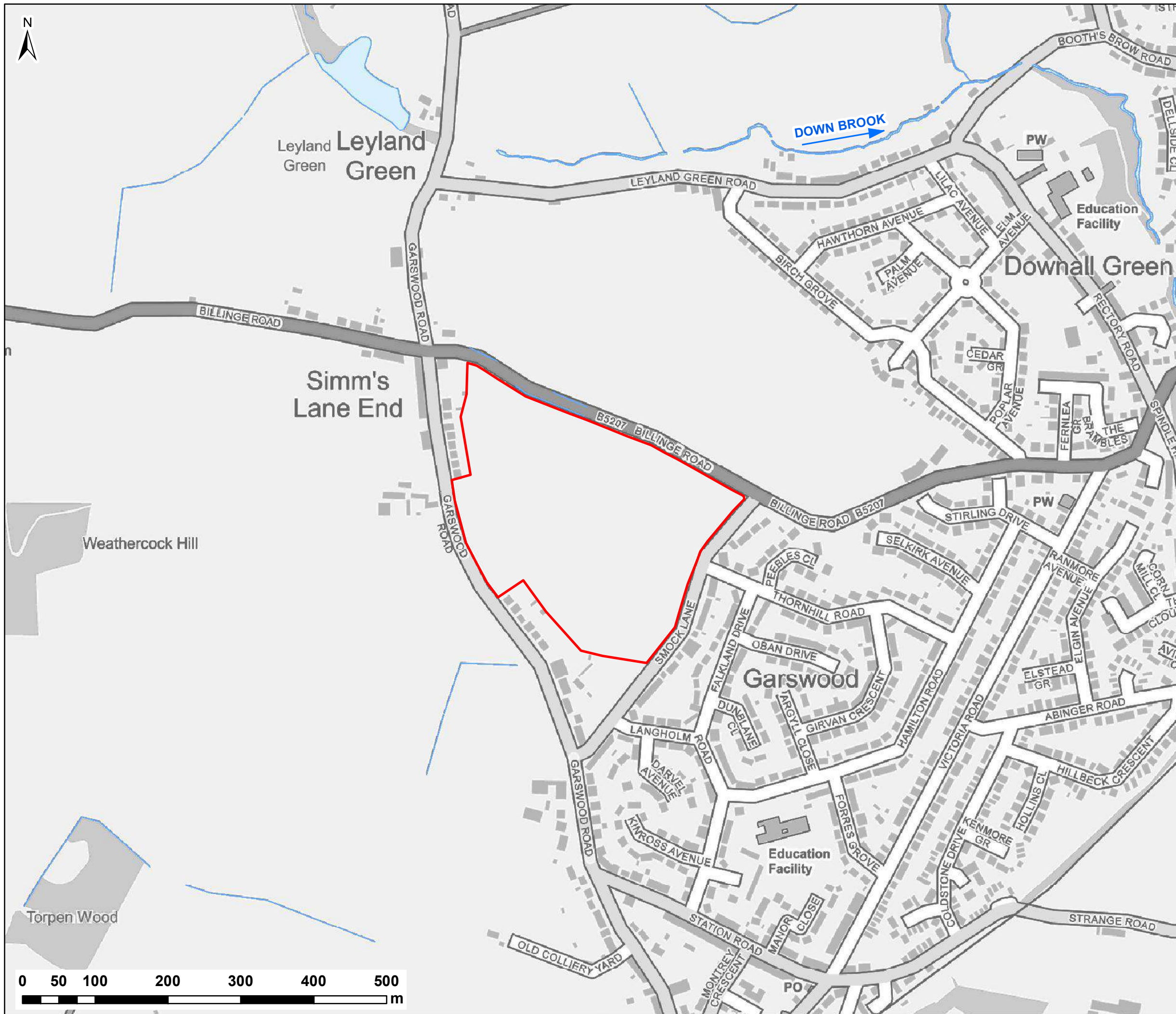
The UU sewer records show that there is a 225mm public combined sewer located within Garswood Road. Based on site levels, a pumped solution to the combined sewer in Garswood Road would be required from the lower eastern extent of the site. There is also a 150mm public foul sewer approximately 40m east of the site flowing north-east within property gardens. The sewer crosses through an area of public open space approximately 40m north-east of the site. Public foul manhole 4902 is located within the area of public open space and could form a point of gravity connection from the development. The final connection points for foul flows are currently under further assessment with UU.

A Concept Designer's Risk Assessment (cDRA) has been prepared to inform future designers of any identified hazards associated with the scheme. The cDRA has been included in Appendix K.

Recommendations

1. Place all dwellings and gardens outside of the surface water flood extent. Access roads within the flood extent should be minimised.
2. Undertake BRE 365 infiltration testing to determine the suitability of infiltration techniques.
3. Make provision for sustainable drainage features in the lower north-eastern extent of the site, however outside of the surface water flood extent.
4. Provide a suitable easement from Rivington Aqueduct which crosses the site.
5. Update this report upon further consultation responses from UU and the LLFA.

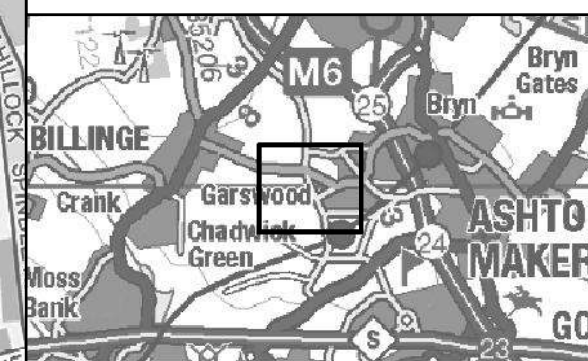
Appendix A Location Plan and Aerial Image



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Watercourses / Water Bodies



CLIENT:



Together, we make a home.

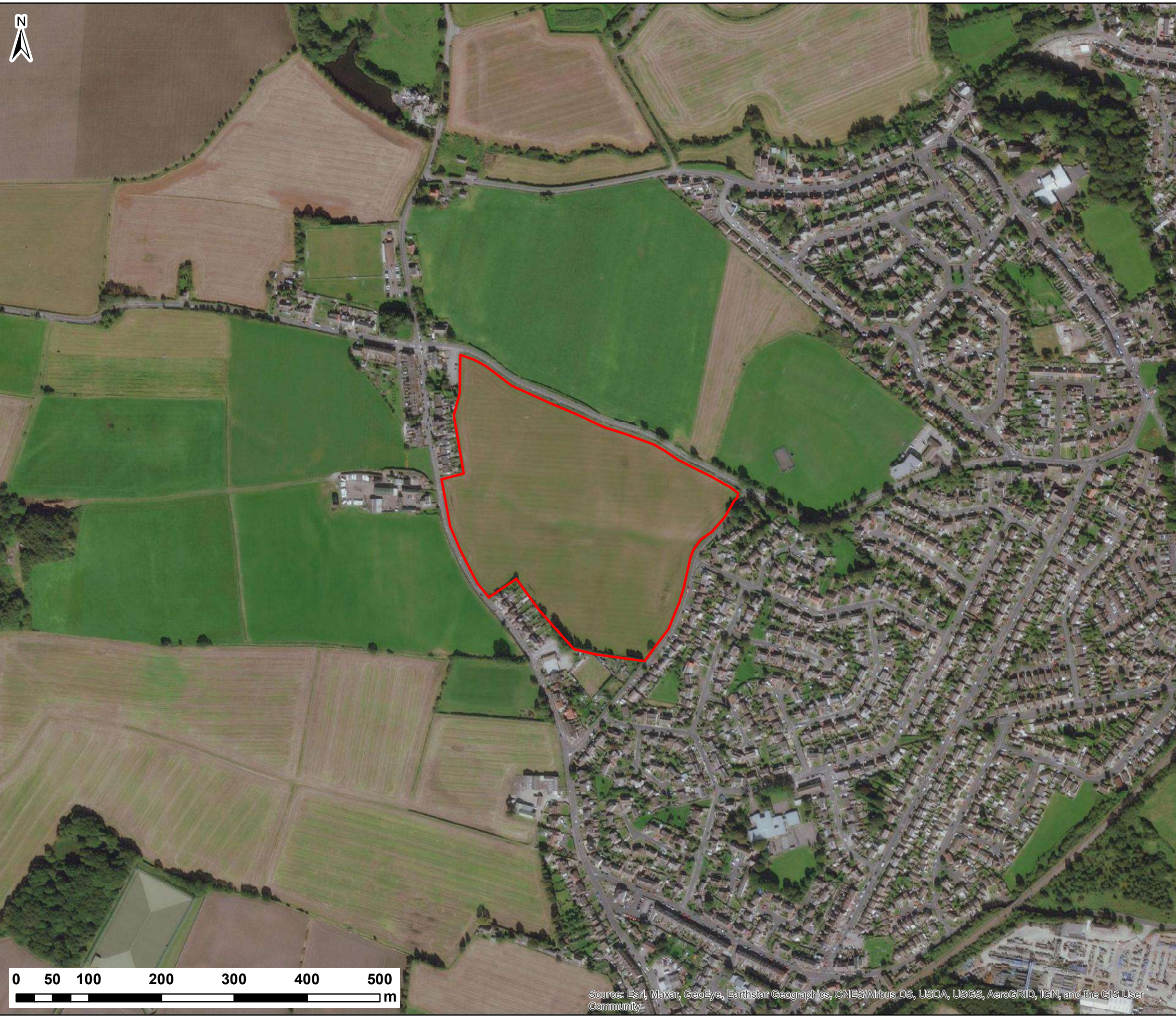


www.waterco.co.uk

SCHEME:
**WEATHERCOCK HILL FARM,
GARSWOOD**

PLOT TITLE:
LOCATION PLAN

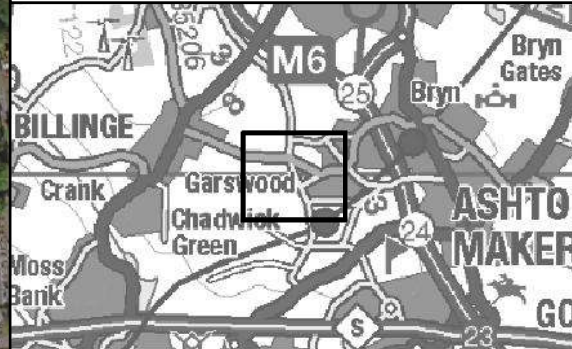
PLOT STATUS: FINAL		DATE: 17/03/2021	
DRAWN: VJ	CHECKED: JR	APPROVED: VG	PLOT SCALE @ A3: 1:5,000 (UNLESS STATED OTHERWISE)
PLOT NAME: 13809-Location_Plan			REV: -



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

Site Boundary



CLIENT:



Persimmon
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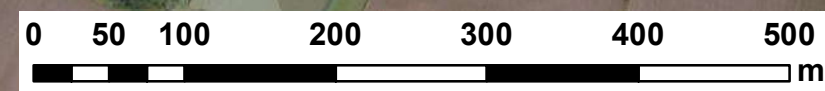
SCHEME:
**WEATHERCOCK HILL FARM,
GARSWOOD**

PLOT TITLE:
AERIAL PLAN

PLOT STATUS: **FINAL** DATE: 17/03/2021

DRAWN: VJ	CHECKED: JR	APPROVED: VG	PLOT SCALE @ A3: 1:5,000 (UNLESS STATED OTHERWISE)
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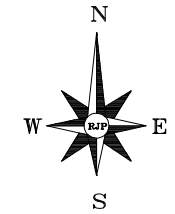
PLOT NAME: 13809-Aerial_Plan	REV: -
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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix B Topographical Data

COORDINATED STATIONS			
STATION	EASTING	NORTHING	LEVEL (m)
A	355401.130	399998.548	83.536
B	355310.557	400044.731	85.121
C	355335.804	399928.944	82.658
E	355316.129	399895.823	83.491
F	355169.521	400101.906	87.446
G	355080.385	400139.602	89.450
J	355307.139	399835.899	85.119
K	355280.908	399782.806	84.833
L	354996.417	399914.444	87.240
M	355012.165	399869.902	86.801
N	354976.085	399981.050	88.056



ABBREVIATIONS	
AV	AIR VALVE/VENT
BOL	BOLLARD
BS	BELGIAN BEACON
BM	BENCH MARK
RL	RED LEVEL
BS	BUS STOP
BT	BRITISH TELECOM
CL	COVER LEVEL
DI	DILAPIDATED
DI	DISUSED
EL	EAVES LEVEL
ELC	ELEC. JUNCT. BOX
EP	ELECTRICITY POLE
FH	FIRE HYDRANT
FL	FLOOR LEVEL
FOS	FULL OF SEDIMENT
FP	FLAG POLE
G	GULLY
GM	GAS METER
GV	GAS VALVE
IC	INSPECT CHAMBER
IL	INVERT LEVEL
JMW	JAPANESE JNOTT WEED
LH	LAMP HOLE
LHP	LAMP POST
NP	NAME PLATE
MH	MANHOLE
PS	POST/SIGN POST
PB	POST BOX
PK	UNKNOWN SERVICE
RE	RODDING EYE
RL	RODGE LEVEL
RS	ROAD SIGN
ST	STOP TAP
TH	TRIAL HOLE
TL	TRAFFIC LIGHT
TP	TELEGRAPH POLE
TV	CABLE TV BOX
U	UNABLE TO LIFT
WM	WATER METER

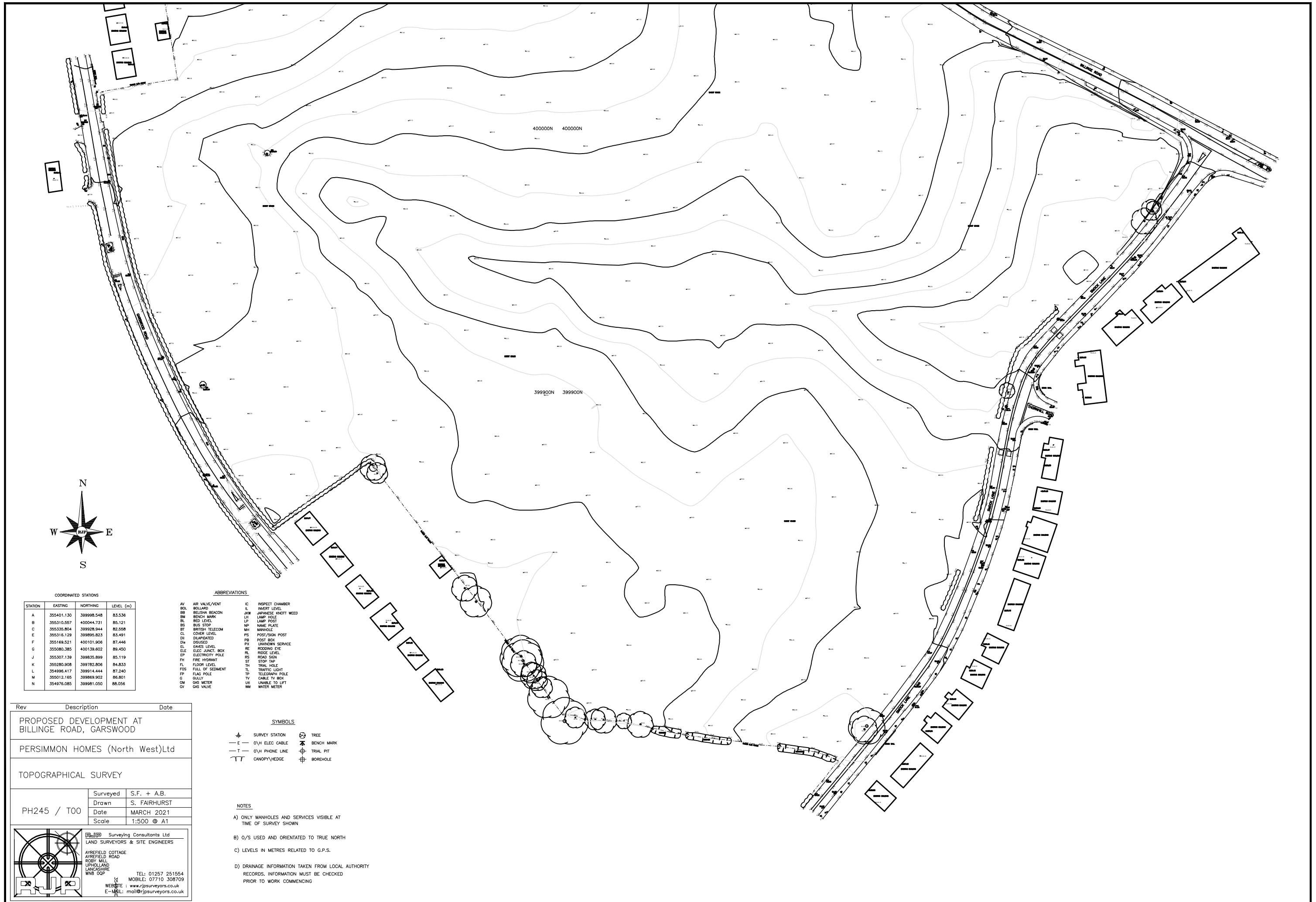
SYMBOLS	
	SURVEY STATION
	O/H ELEC CABLE
	O/H PHONE LINE
	CANOPY/HEDGE
	TREE
	BENCH MARK
	TRIAL PIT
	BOREHOLE

- NOTES
- A) ONLY MANHOLES AND SERVICES VISIBLE AT TIME OF SURVEY SHOWN
 - B) O/S USED AND ORIENTATED TO TRUE NORTH
 - C) LEVELS IN METRES RELATED TO G.P.S.
 - D) DRAINAGE INFORMATION TAKEN FROM LOCAL AUTHORITY RECORDS. INFORMATION MUST BE CHECKED PRIOR TO WORK COMMENCING

Rev	Description	Date
	PROPOSED DEVELOPMENT AT BILLINGE ROAD, GARSWOOD	
	PERSIMMON HOMES (North West)Ltd	
TOPOGRAPHICAL SURVEY		
PH245 / T00	Surveyed	S.F. + A.B.
	Drawn	S. FAIRHURST
	Date	MARCH 2021
	Scale	1:1250 @ A3

Surveying Consultants Ltd
 LAND SURVEYORS & SITE ENGINEERS
 AYREFIELD COTTAGE
 AYREFIELD ROAD
 ROSEY MILL
 UPHOLLAND
 LANCASHIRE
 WN5 0QP
 TEL: 01257 251554
 MOBILE: 07710 308709
 WEBSITE: www.rjsurveyors.co.uk
 E-MAIL: mail@rjsurveyors.co.uk





COORDINATED STATIONS

STATION	EASTING	NORTHING	LEVEL (m)
A	355401.130	399998.548	83.536
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M	355012.165	399869.902	86.801
N	354976.085	399981.050	88.056

ABBREVIATIONS

AV	AIR VALVE/VENT	IC	INSPECT CHAMBER
BL	BOLLARD	IL	INVERT LEVEL
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BM	BENCH MARK	LH	LAMP POST
BL	BED LEVEL	LP	LAMP POST
BS	BUS STOP	NP	NAME PLATE
BT	BRITISH TELECOM	MH	MANHOLE
CL	COVER LEVEL	PS	POST/SIGN POST
DI	DISAPPOINTED	PB	POST BOX
DW	DRUSED	PS	POST BOX
ELE	EAMES LEVEL	PS	POST BOX
ELE	ELEC JUNCT. BOX	RE	ROOFTOP EYE
EL	ELECTRICITY POLE	RS	ROAD SIGN
FI	FIRE HYDRANT	RL	RODGE LEVEL
FL	FLOOR LEVEL	RS	ROAD SIGN
FOS	FULL OF SEDIMENT	ST	STOP SIGN
FP	FLAG POLE	TH	TRIAL HOLE
G	GULLY	TL	TRAFFIC LIGHT
GM	GAS METER	TP	TELEGRAPH POLE
GV	GAS VALVE	TV	CABLE TV BOX
		UL	UNABLE TO LIFT
		WM	WATER METER

SYMBOLS

+	SURVEY STATION	⊗	TREE
—E—	O/H ELEC CABLE	⊕	BENCH MARK
—T—	O/H PHONE LINE	⊕	TRIAL PIT
—TT—	CANOPY/HEDGE	⊕	BOREHOLE

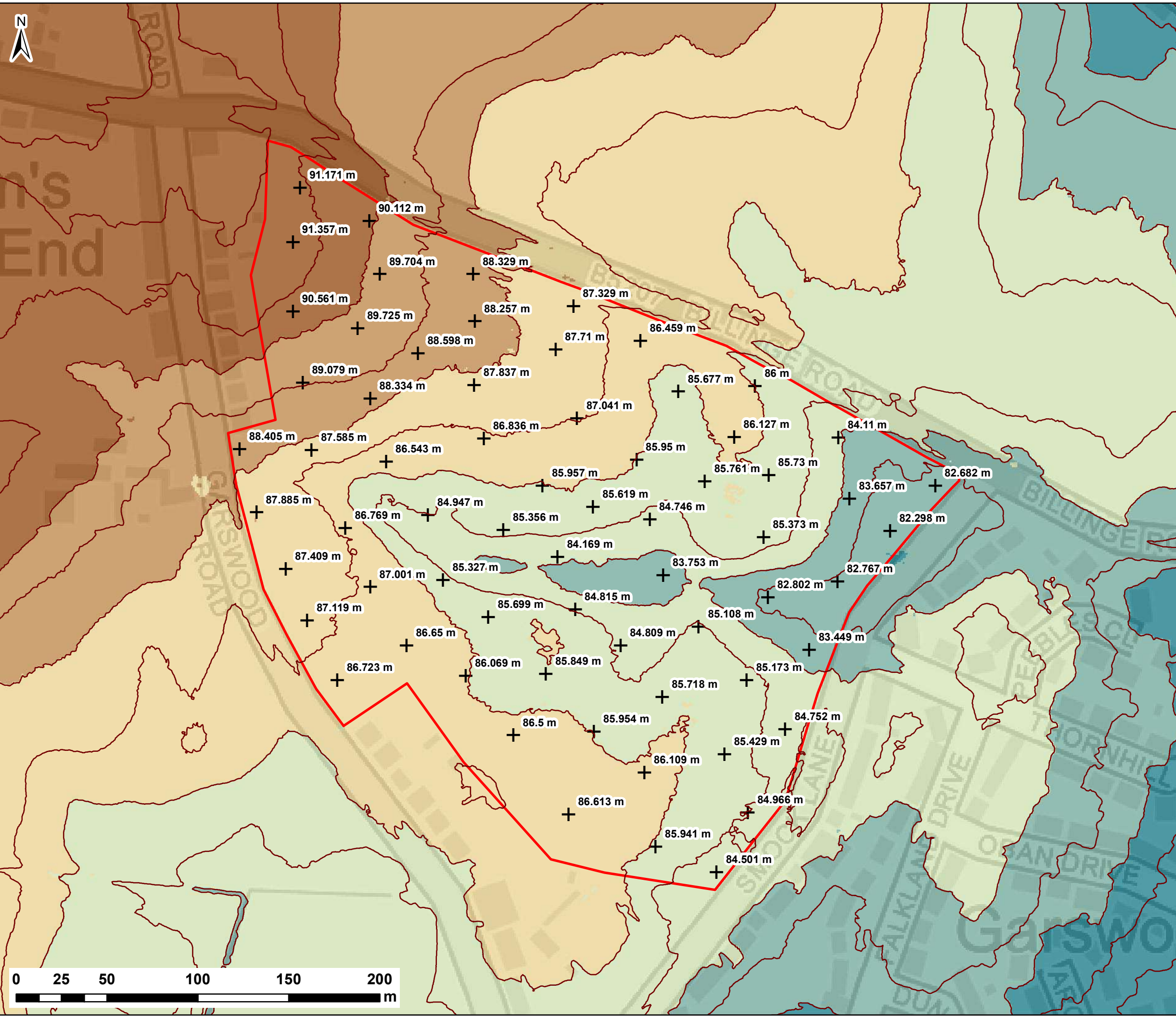
- NOTES
- A) ONLY MANHOLES AND SERVICES VISIBLE AT TIME OF SURVEY SHOWN
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Rev	Description	Date
PROPOSED DEVELOPMENT AT BILLINGE ROAD, GARSWOOD		
PERSIMMON HOMES (North West)Ltd		
TOPOGRAPHICAL SURVEY		
PH245 / T00	Surveyed	S.F. + A.B.
	Drawn	S. FAIRHURST
	Date	MARCH 2021
	Scale	1:500 @ A1

Surveying Consultants Ltd
LAND SURVEYORS & SITE ENGINEERS

AYREFIELD COTTAGE
AYREFIELD ROAD
ROSEY MILL
UPHOLLAND
LANCASHIRE
WN8 0QP

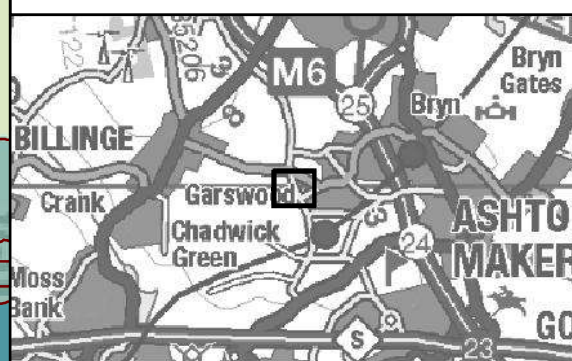
TEL: 01257 251554
MOBILE: 07710 308709
WEBSITE: www.rjpsurveyors.co.uk
E-MAIL: mail@rjpsurveyors.co.uk



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- + Site Levels
- Ground Elevation (m AOD)**
- <82
- 82-84
- 84-86
- 86-88
- 88-90
- >90



CLIENT:



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www.waterco.co.uk

SCHEME:
**WEATHERCOCK HILL FARM,
GARSWOOD**

PLOT TITLE:
**LIDAR ELEVATIONS
1m RESOLUTION**

PLOT STATUS: FINAL			DATE: 17/03/2021
DRAWN: VJ	CHECKED: JR	APPROVED: VG	PLOT SCALE @ A3: 1:2,000 (UNLESS STATED OTHERWISE)
PLOT NAME: 13809-Lidar			REV: -

Appendix C Historical Borehole Record



Sampling		Properties			Strata		35488, 40002				
Depth	Type	Cu kPa	w%	SPT N	Description	SD50SW193	Depth	Level	Legend		
					MADE GROUND: Black top**		G.L.	69.30			
					MADE GROUND: Stone ballast**		0.20	69.10			
					Sandy brown clay**		0.40	68.90			
1.50-1.95	SD			12			1.40	67.90			
2.00	B				Soft to firm grey-black occasionally mottled brown very sandy CLAY with some sub-angular to sub-rounded fine and medium gravel.						
3.00-3.45	SD			14			3.00	66.30			
4.00	B				Medium dense grey-brown occasionally mottled orange-black fine and medium SAND with much clay and some fine and medium sub-rounded gravel.						
4.50-4.95	SD			18			4.00	65.30			
5.80-6.00	B				Grey-brown occasionally mottled black very clayey SILT with some sand and some fine and medium sub-rounded gravel.						
6.00-6.50	UB						5.80	63.50			
6.50-6.95	U				Stiff grey-brown CLAY with occasional pockets (>30mm) of orange-brown fine and medium sand.						
6.95	D										
7.50-8.00	B						7.50	61.80			
8.00-8.45	U				Firm to stiff grey-brown very sandy CLAY with much silt and sub-angular fine gravel.						
8.50	DB						8.70	60.60			
8.50-8.95	U										
9.00	D				Grey thinly bedded moderately weathered MUDSTONE/SILTSTONE (fine sandy in places), recovered as sand and gravel.		9.00	60.30			
					End of Borehole						
Location		Co-ordinates:			Ground Level: 69.30m A00		Chainage:				
Drilling					Groundwater						
Type	From	To	Size	Fluid	Struck	Behaviour	Sealed	Date	Hole	Cased	Water
Cable Percussive	GL	9.00	0.15		5.80	Rose to 3.50m in 30 minutes. Partially sealed by casing.	7.50	27.10.89	9.00	9.00	8.00
Remarks		Inspection pit hand excavated to 1.40m. **Drillers description. Standpipe installed at 9.00m depth.									
Borehole Record					Project			Contract			
					Victoria Road, Garswood			D9105/1			
					St Helens Metropolitan Borough			Borehole			
								34 (1 of 1)			
Exploration Associates											

Appendix D United Utilities Sewer Plan and Correspondence

Waterco

**Waterco
lon parcwr,
ruthin, denbighshire
ll15 1nj**

FAO:

How to contact us:

**United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP**

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

**Your Ref: 13809-Weathercock Hill Farm
Our Ref: UUPS-ORD-255396
Date: 05/03/2021**

Dear Sirs

Location: 430 GARSWOOD ROAD, ASHTON-IN-MAKERFIELD, WIGAN, WN4 0XJ

I acknowledge with thanks your request dated 01/03/2021 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

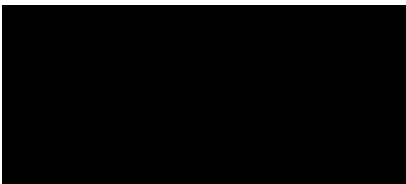
The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
3907	FO		100			VC		78.7912	
3712	FO		100			VC		14.07225	
2609	FO		100			VC		8.581862	
3902	SW	0	150			VC		44.59821	
3806	FO		100			VC		8.575053	
2966	CO		150			VC		11.02986	
2602	SW	82.44	150			VC		48.87217	
9108	CO		150			VC		16.815786	
2706	FO		100			VC		11.03239	
4862	FO		150			VC		60.14537	
2701	SW	0	225			VC		43.38202	
4701	SW	0	225			VC		47.18091	
1600	CO		225			VC		85.4035	
3701	SW	0	150			VC		43.88066	
3903	SW	0	150			VC		104.7955	
3603	81.16	SW	79.87	300		VC		83.52005	1 in 267
1605	85.06	SW	82.67	225		VC		84.33981	1 in 63
3901	SW	0	225			VC		55.88591	
4803	FO		100			VC		7.32841	
8004	CO		150			VC		10.89208	
8003	CO		150			VC		19.05351	
4903	FO		100			VC		5.13823	
2606	CO		150			VC		19.39826	
3902	SW	0	225			VC		20.34846	
2604	CO		150			VC		3.04254	
1700	CO		225			VC		68.35203	
3705	FO		150			VC		42.18126	
4901	SW	0	225			VC		93.52018	
3703	SW	0	150			VC		70.42987	
3903	SW	0	600			CO		149.5627	
2603	SW	0	150			VC		69.18062	
2707	FO		100			VC		7.23091	
2605	CO		150			VC		39.3339	
3801	SW	0	150			VC		39.92493	
3802	SW	0	225			VC		81.0432	
4802	FO		100			VC		9.001818	
4910	FO		100			VC		13.96972	
9001	CO		225			VC		222.408	
4705	FO		100			VC		37.07203	
3711	FO		150			VC		19.54178	
8204	SW	0	150			VC		27.8178	
8209	FO		100			VC		23.71809	
0801	CO	0	225			VC		67.85587	
3714	FO		100			VC		12.55445	
4910	FO		150			CI		8.548533	
9110	CO		225			VC		3.280832	

Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
------	-------	------	--------	--------	--------	-------	------	--------	------

LEGEND

Abandoned Foul Surface Water Combined Public Sewer

Private Sewer Section 104

Rising Main Sludge Main

Overflow Water Course Highway Drain

All point assets follow the standard colour convention:
 red - combined blue - surface water
 brown - foul purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

FO Foul
 SW Surface Water
 CO Combined
 OV Overflow

SEWER SHAPE

CI Circular TR Trapezoidal
 EG Egg AR Arch
 OV Oval BA Barrel
 FT Flat Top HO HorseShoe
 RE Rectangular UN Unspecified
 SG Square

SEWER MATERIAL

AC Asbestos Cement
 BR Brick
 PE Polyethylene
 RP Reinforced Plastic Matrix
 CO Concrete
 CSB Concrete Segment Bolted
 CSU Concrete Segment Unbolted
 CC Concrete Box Culvert
 PSC Plastic / Steel Composite
 GRC Glass Reinforced Plastic
 DI Ductile Iron
 PVC Polyvinyl Chloride
 CI Cast Iron
 SI Spun Iron
 ST Steel
 VC Vitified Clay
 PP Polypropylene
 PF Pitch Fibre
 MAC Masonry, Coursed
 MAR Masonry, Random
 U Unspecified

Address or Site Reference:
 430 GARSWOOD ROAD,
 ASHTON-IN-MAKERFIELD,
 WIGAN,
 WN4 0XJ

Scale: 1:1250 **Date:** 05/03/2021

Sheet: 1 of 1

Printed by: Property Searches

SEWER RECORDS **United Utilities**
 Water for the North West

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.
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Jessica Roberts

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 17 March 2021 12:04
To: Jessica Roberts
Cc: Wastewater Developer Services
Subject: 4200037987 Weathercock Hill Farm, Billinge Road, Leyland Green, Seneley Green, Garswood, St Helens, North West, WN4 OSP

Categories: Info

Good morning Jessica,

Pre Development Enquiry for: Weathercock Hill Farm, Billinge Road, Leyland Green, Seneley Green, Garswood, St Helens, North West, WN4 OSP UU Reference Number : 4200037987

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

The foul connection point is required to be assessed further and has now been referred to our asset management team.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

- 1. into the ground (infiltration);**
- 2. to a surface waterbody;**
- 3. to a surface water sewer or highway drain;**

4. to a combined sewer.

For guidance, The North West SuDS Pro-Forma provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:
<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

<https://www.gov.uk/government/publications/groundwater-protection-position-statements>

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the open ordinary watercourse's located both north and south of the proposed site.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

We would advise you to contact and discuss climate change factors with the LLFA.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect

the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the public sewerage network under any circumstances

Sewer Adoptions

You have indicated on your application form that you intend to put the sewers forward for adoption (including any SuDS components that can come within the meaning of a sewer).

United Utilities assess adoption applications based on the current Design & Construction Guidance and local practices which have now replaced 'Sewers For Adoption 6th Edition'.

We recommend that you submit a pre design assessment to the sewer adoption mailbox (SewerAdoptions@uuplc.co.uk) stating pre design assessment in the title

Please refer to links below to obtain further guidance:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-adoptions/>

Site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

If you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements set out in the Design & Construction Guidance. The proposed design should give consideration to long term operability and give United Utilities a safe and cost effective proposal for the lifetime of the assets. In these cases, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 application, has been assessed and accepted in writing by United Utilities. Any work carried out prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

Codes For Adoption

The new Codes for Adoption are outlined on the Water UK Website. The link below takes you to their webpage:

<https://www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/>

A free copy of the new Design & Construction Guidance can be downloaded via the link below:

<https://www.water.org.uk/wp-content/uploads/2020/03/SSG-App-C-Des-Con-Guide-v-2-100320-C.pdf>

Existing Water Assets Crossing the Site

The Rivington Aqueduct crosses your site please refer to the information below for your consideration.

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/>

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/>

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

Shoaib.



Shoaib Tauqeer
Developer Engineer
Developer Services & Metering
M: 07876745601
unitedutilities.com

If you have received a great service today why not tell us?

Visit: [unitedutilities.com/wow](https://www.unitedutilities.com/wow)

Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry <https://www.unitedutilities.com/builders-developers/> or you can email us at developerserviceswater@uuplc.co.uk

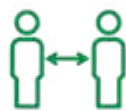
Coronavirus | Prevent the spread



Wash your hands



Disinfect common surfaces



Practise social distancing



Stay home if you have symptoms

[Click for our message to customers](#)

From: Jessica Roberts [mailto:jessica.roberts@waterco.co.uk]

Sent: 05 March 2021 12:04

To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Subject: 13809- Pre Developer Enquiry Request

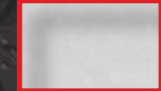







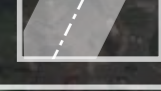
Proposed residential development at Weathercock Hill Farm, Billingde Road, Leyland Green, Seneley Green, Garswood, St Helens, North West, WN4 0SP.


Dear Sir/Madam,

Appendix E Indicative Development Plan



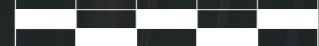
Key

-  Site Boundary
-  Sensitive Interfaces with existing Residential Properties
-  Poor & Gappy Field Boundary Hedges
-  Key Views out of the Site
-  Existing Trees & Tree Groups
-  Potential Vehicular Access Points
-  Potential Pedestrian/Cycle Access Points
-  Potential to Continue Building Line
-  Trunk Water Main Easement



n*ORTH

0m 20m 40m 60m 80m 100m



Scale 1:2,500 (@A3)

Ordnance Survey © Crown copyright 2019
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e*SCAPE 10 years
urbanists 2009-2019

Project Title
Weathercock Hill Farm, Garswood

e*SCAPE Job No.
019-009

Client
Persimmon Homes North West

Drawing Number	Revision
019-009-P002	REV -

Drawing Title
Constraints & Opportunities Plan

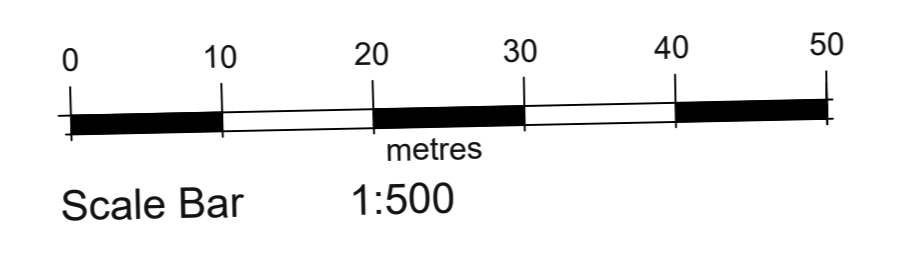
Scale	Date
1:2,500 @ A3	March '19

DO NOT SCALE FROM THIS DRAWING
ALL DIMENSIONS MUST BE VERIFIED AT THE SITE BEFORE SETTING OUT,
CONSULTING WITH US REGARDING ANY DISCREPANCIES

GARSWOOD				
HOUSE TYPE MIX				
House type	Description	SQFT	Number Of Units	%
Madisson bungalow	1 storey 2 bed	650 SQFT	8	3.1007752
Gilby bungalow	1.5 storey 3 bed	1194 SQFT	4	1.5503876
Alnmouth mid (Alnwick)	2 Storey 2 Bed	643 SQFT	5	2
Alnmouth end (Alnwick)	2 Storey 2 Bed	643 SQFT	8	3
Hanbury semi (Barton)	2 Storey 3 Bed	761 SQFT	20	8
Hanbury mid (Barton)	2 Storey 3 Bed	761 SQFT	4	2
Hanbury end (Barton)	2 Storey 3 Bed	761 SQFT	8	3
Rufford dett (Buttermere)	2 Storey 3 bed	870 SQFT	6	2
Rufford semi (Buttermere)	2 Storey 3 Bed	870 SQFT	26	10
Souler end (Windermere)	3 Storey 3 Bed	951 SQFT	18	7
Souler mid (Windermere)	3 Storey 3 Bed	951 SQFT	11	4
Hatfield (Derwent)	2 Storey 3 Bed	969 SQFT	13	5
Clayton (Lockwood)	2 Storey 3 Bed	999 SQFT	23	9
Roseberry (Hornsea)	2 Storey 4 bed	1096 SQFT	44	17
Kendal (Kendal)	2 storey 4 bed	1190 SQFT	43	17
Chedworth (Coniston)	2 storey 4 bed	1222 SQFT	17	7
			258	
AFFORDABLE				
Hanbury	2 Storey 3 Bed	761 SQFT	0	0
Alnwick	2 Storey 2 Bed	638 SQFT	0	0
			0	
TOTAL		263808 SQFT	258	
Gross Site Area		24.75 Acres	10.02 Hectares	
Undevelopable		2.19 Acres	0.8862711 Hectares	
Public open space		5 Acres	2.02 Hectares	
Nett Site Area:		17.56 Acres	7.11 Hectares	
Gross Density:		10.42 Units/Acre	25.76 Units/Hectare	
Nett Density:		14.69 Units/Acre	36.31 Units/Hectare	
Gross Footage:		10254.87 SQFT/Acre	2354.17 SQM/Hectare	
Nett Footage:		14453.76 SQFT/Acre	3318.09 SQM/Hectare	



BILLINGE ROAD, GARSWOOD
VIABILITY LAYOUT



PERSIMMON
Persimmon Homes (North West)
30-34 Crofts Bank Road
Urmston
Manchester
M41 0JH
Tel: 0161 746 3737 Fax: 0161 748 3272

SITE: BILLINGE ROAD, GARSWOOD

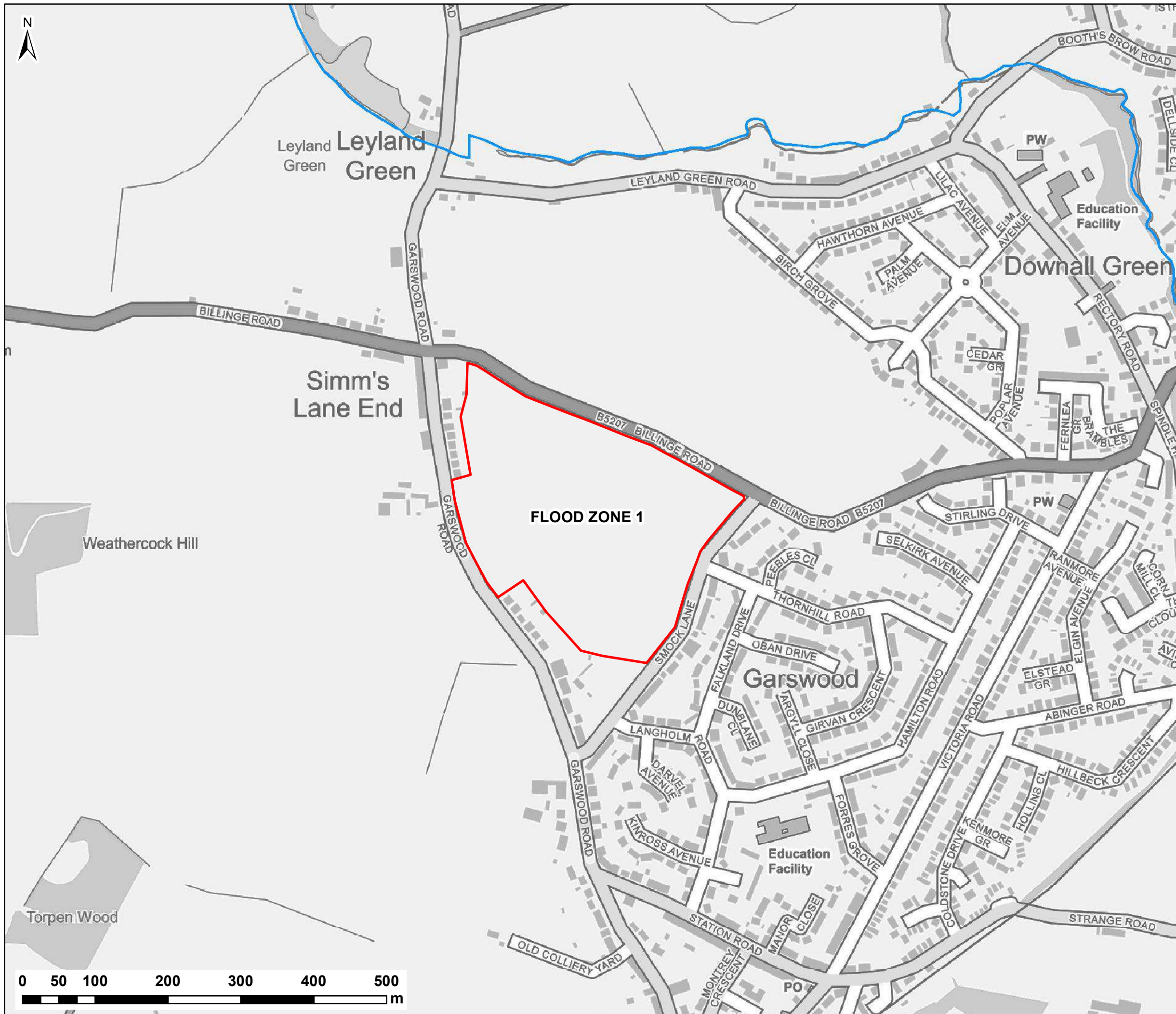
TITLE: VIABILITY LAYOUT

SCALE: 1:500@A0 DATE: 17.03.21

DRAWN BY: SDA CHECKED BY: REVISION:

NUMBER: BRG/SDA/01

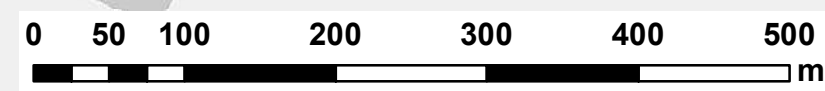
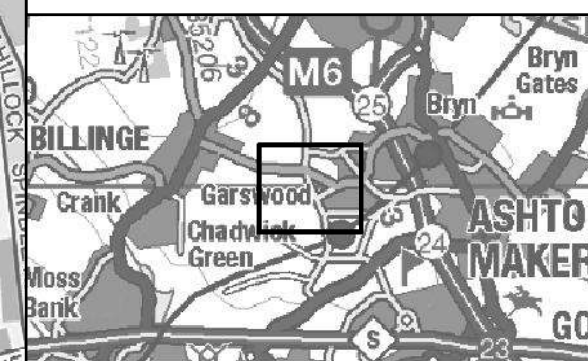
Appendix F EA Flood Maps



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- EA Main Rivers
- EA Flood Zone 3
- EA Flood Zone 2



CLIENT:

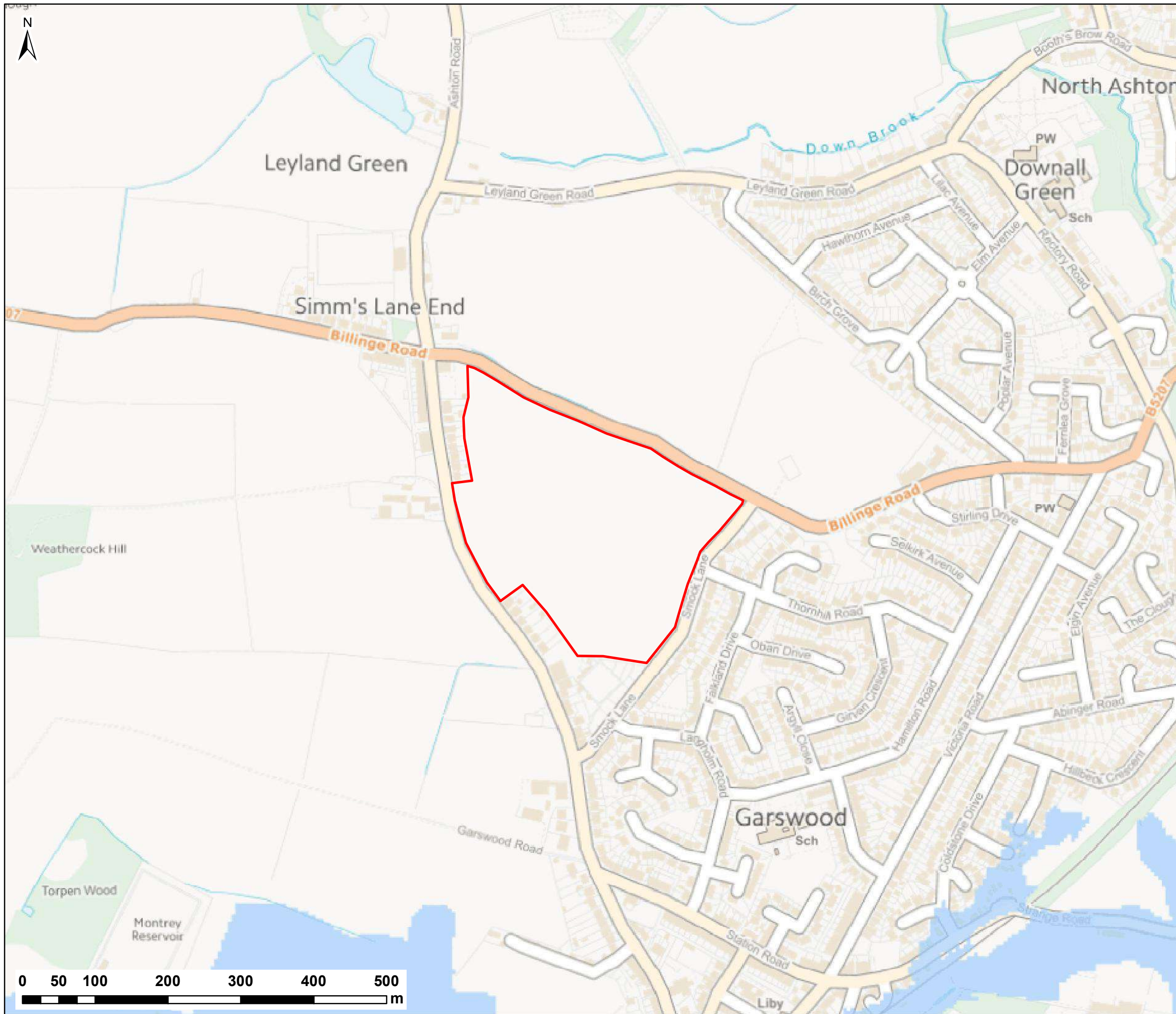
 **Persimmon**
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SCHEME:
**WEATHERCOCK HILL FARM,
GARSWOOD**

PLOT TITLE:
EA FLOOD MAP FOR PLANNING
DATA ACCESSED MARCH 2021

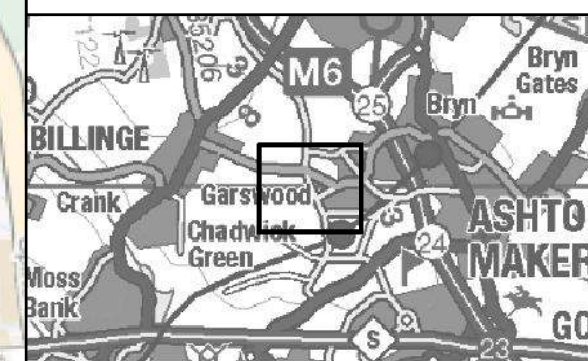
PLOT STATUS: FINAL		DATE: 17/03/2021	
DRAWN: VJ	CHECKED: JR	APPROVED: VG	PLOT SCALE @ A3: 1:5,000 (UNLESS STATED OTHERWISE)
PLOT NAME: 13809-EA_FZ_FM			REV: -



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- EA Reservoir Flood Map



CLIENT:



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www.waterco.co.uk

SCHEME:
**WEATHERCOCK HILL FARM,
GARSWOOD**

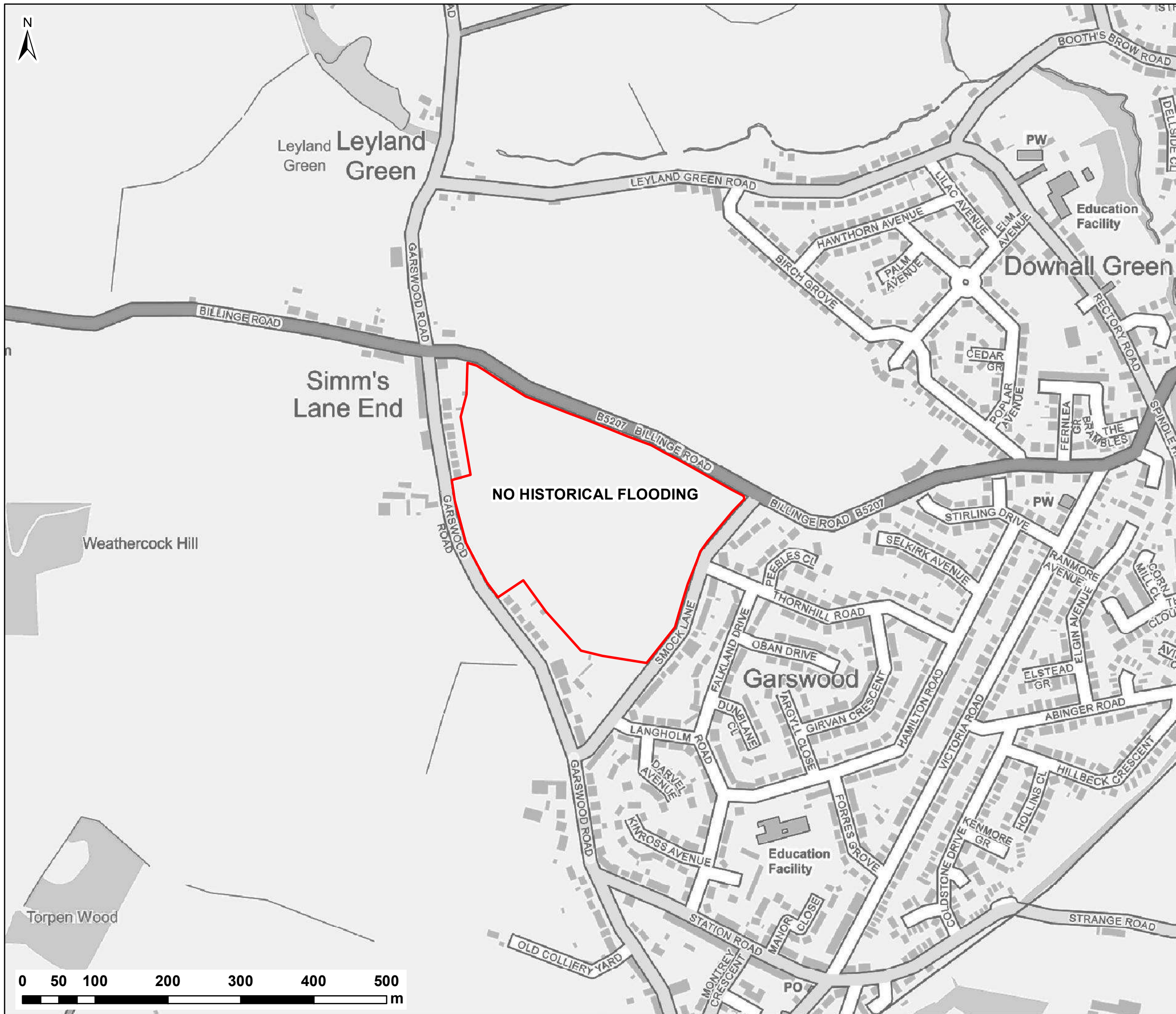
PLOT TITLE:
**EA FLOOD RISK
FROM RESERVOIRS
DATA ACCESSED MARCH 2021**

PLOT STATUS: **FINAL** DATE: 17/03/2021

DRAWN: VJ	CHECKED: JR	APPROVED: VG	PLOT SCALE @ A3: 1:5,000 (UNLESS STATED OTHERWISE)
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PLOT NAME: 13809-EA_Res REV: -

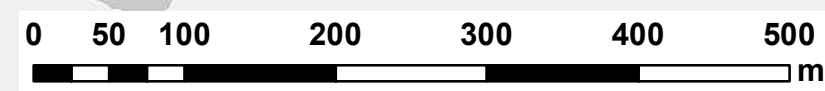
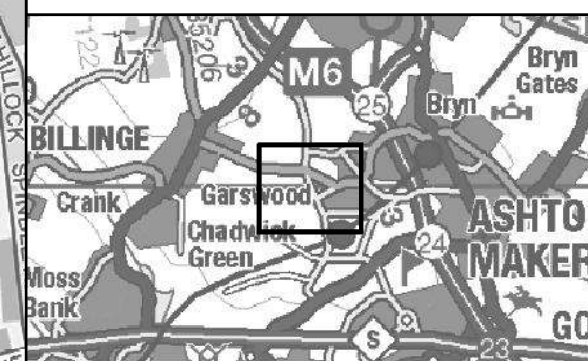




NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Historical Flood Map



CLIENT:

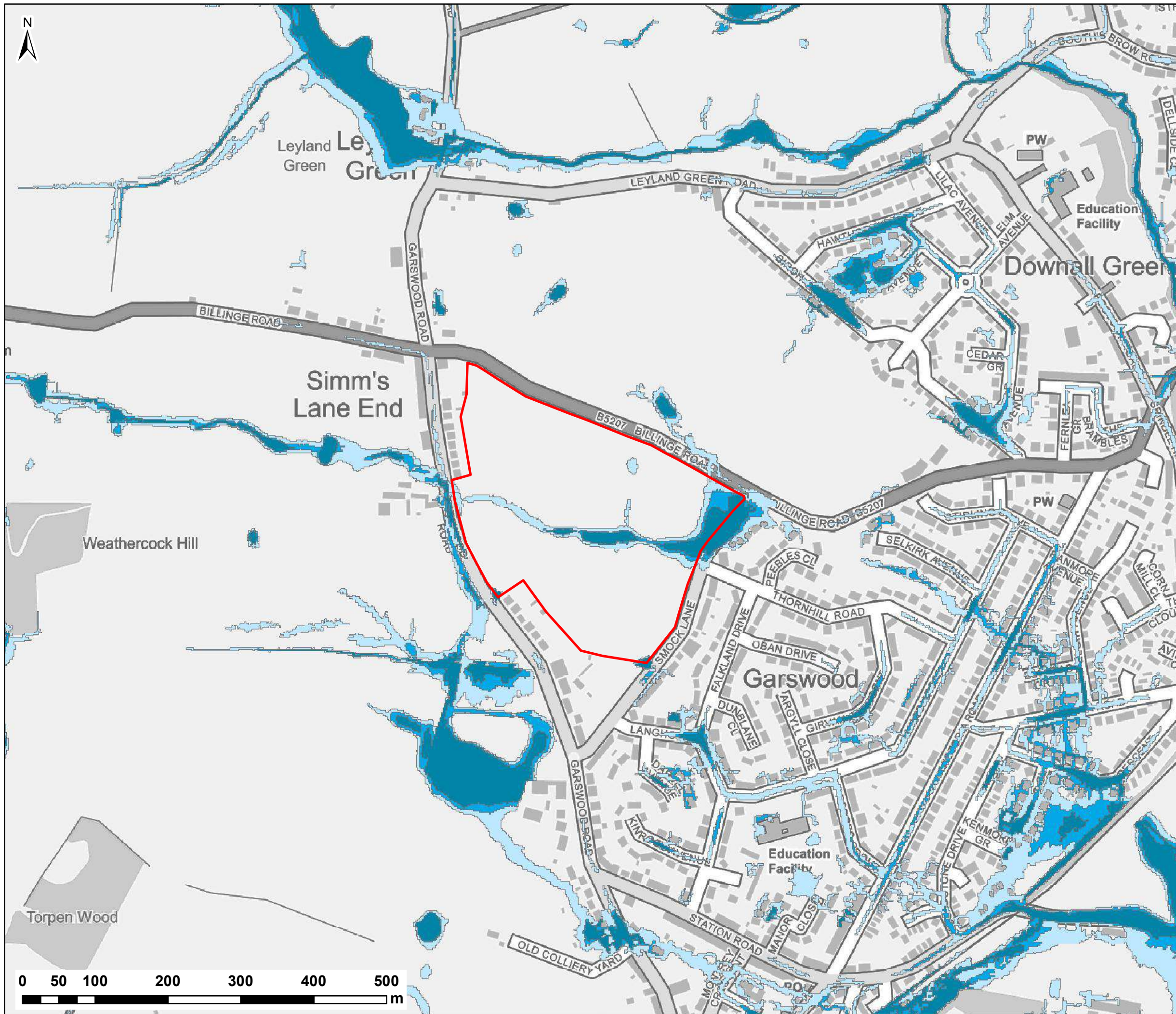
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SCHEME:
**WEATHERCOCK HILL FARM,
GARSWOOD**

PLOT TITLE:
**EA HISTORICAL FLOOD MAP
DATA ACCESSED MARCH 2021**

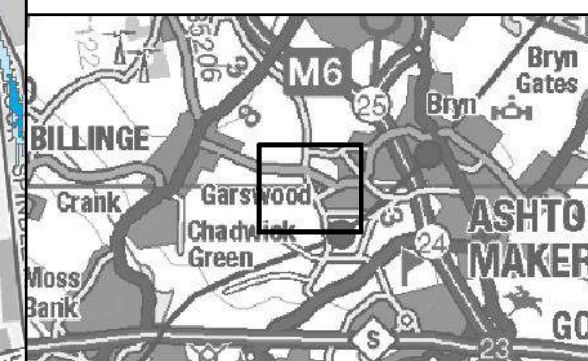
PLOT STATUS: FINAL		DATE: 17/03/2021	
DRAWN: VJ	CHECKED: JR	APPROVED: VG	PLOT SCALE @ A3: 1:5,000 (UNLESS STATED OTHERWISE)
PLOT NAME: 13809-EA_Hist			REV: -



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- High (3.3% or greater)
- Medium (between 1.0% and 3.3%)
- Low (between 0.1% and 1.0%)



CLIENT:



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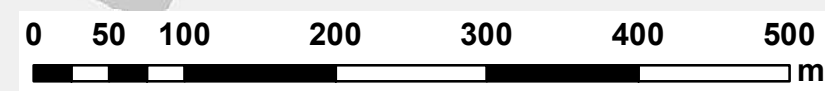


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SCHEME:
**WEATHERCOCK HILL FARM,
GARSWOOD**

PLOT TITLE:
**EA FLOOD RISK FROM
SURFACE WATER
DATA ACCESSED MARCH 2021**

PLOT STATUS: FINAL		DATE: 17/03/2021
DRAWN: VJ	CHECKED: JR	APPROVED: VG
PLOT NAME: 13809-EA_SW_FM		PLOT SCALE @ A3: 1:5,000 (UNLESS STATED OTHERWISE)
		REV: -



Appendix G LLFA Correspondence

Jessica Roberts

From: [REDACTED]
Sent: 05 March 2021 19:55
To: Jessica Roberts
Cc: Kieran Philip Birch
Subject: Re: 13809-LLFA request

Afternoon Jessica

I hope you are well and keeping safe.

My name is Matthew Catherall from St Helens Council LLFA. I am replying to your email regarding your 13809-LLFA request for information in terms of a potential planning application.

[Proposed residential development at Weathercock Hill Farm, Billinge Road, Leyland Green, Seneley Green, Garswood, St Helens, North West, WN4 OSP.](#)

At this stage of the development and level of information, I am unable to provide formal comment on the layout or proposed drainage method. I am able to provide generic advice and guidance for the development along with answers to a few of your queries.

In terms of flood risk, there has been surface water runoff flooding from the farmland onto the highway Smock Lane (near the junction of Smock Lane and Billinge Road B5207), this is representative of the EA surface water flood risk mapping (30, 100, 1000 year return period).

St Helens Council have our own SuDS Guidance that is available in the link below. The files include the main guidance and local standards, a separate checklist for developers which needs to be submitted with each application, and a surface water runoff calculator. The runoff calculator is currently not available as it is going through technical updates. The full SuDs hierarchy will have to be followed for this development.

<https://www.sthelens.gov.uk/traffic-travel-parking/highway-maintenance/flooding-and-drainage/sustainable-drainage/>

The NPPF climate change figures have now been superseded with higher values (40% is Council planning baseline) as shown in the government report (19th February 2019) and we will expect to see the surface water discharge rate to be set to Greenfield runoff for the development. The site catchment discharge must follow where possible the natural drainage paths / location.

I hope the above answers your queries, if you have further questions, please get back in contact

Regards

Matthew Catherall
LLFA

From: Jessica Roberts <jessica.roberts@waterco.co.uk>
Sent: 05 March 2021 14:10

Appendix H REFH2 Greenfield Runoff Rates


DOCUMENT VERIFICATION RECORD	
Project:	Weathercock Hill Farm, Garswood
Client:	Persimmon Homes Ltd
Report Title:	13809-FRA + DRA-01
Date:	27/04/2021

DOCUMENT REVIEW & APPROVAL	
Author:	Jessica Roberts BSc (Hons)
Checker:	Aled Williams BSc (Hons) MCIWEM
Approver:	Victoria Griffin BSc (Hon) MSc MEnvSc CEnv

ReFH2 RUNOFF RATES*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	61.40653
2	69.26882
5	96.42207
10	116.6967
30	153.7728
50	174.6119
75	193.859
100	209.2663
200	253.5452
1000	393.2832

*Runoff Rates printed from the ReFH Flood Modelling software package


Appendix I MicroDrainage Simulation

Waterco Ltd		Page 1
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ	13809-Weathercock Hill Farm Garswood 1 in 100 year plus 40% CC	
Date 19/04/2021 File 13809-1 in 100 year +40...	Designed by JR Checked by AW	
XP Solutions	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Summer	9.493	0.493	61.4	837.6	O K
30 min Summer	9.642	0.642	61.4	1091.8	O K
60 min Summer	9.786	0.786	61.4	1336.9	Flood Risk
120 min Summer	9.859	0.859	61.4	1460.3	Flood Risk
180 min Summer	9.875	0.875	61.4	1487.6	Flood Risk
240 min Summer	9.874	0.874	61.4	1485.9	Flood Risk
360 min Summer	9.860	0.860	61.4	1462.0	Flood Risk
480 min Summer	9.835	0.835	61.4	1420.1	Flood Risk
600 min Summer	9.804	0.804	61.4	1367.5	Flood Risk
720 min Summer	9.768	0.768	61.4	1306.1	Flood Risk
960 min Summer	9.696	0.696	61.4	1182.5	O K
1440 min Summer	9.569	0.569	61.4	966.8	O K
2160 min Summer	9.430	0.430	61.3	731.4	O K
2880 min Summer	9.344	0.344	60.1	584.6	O K
4320 min Summer	9.272	0.272	52.7	461.8	O K
5760 min Summer	9.239	0.239	44.7	407.1	O K
7200 min Summer	9.219	0.219	39.2	371.9	O K
8640 min Summer	9.204	0.204	35.2	346.4	O K
10080 min Summer	9.192	0.192	32.1	326.9	O K
15 min Winter	9.554	0.554	61.4	941.6	O K
30 min Winter	9.723	0.723	61.4	1229.7	Flood Risk


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	137.991	0.0	848.9	17
30 min Summer	91.711	0.0	1134.5	32
60 min Summer	58.232	0.0	1466.7	62
120 min Summer	34.279	0.0	1727.7	120
180 min Summer	25.097	0.0	1897.8	180
240 min Summer	20.091	0.0	2026.0	206
360 min Summer	14.646	0.0	2215.6	268
480 min Summer	11.674	0.0	2354.7	334
600 min Summer	9.781	0.0	2466.1	404
720 min Summer	8.461	0.0	2559.5	470
960 min Summer	6.724	0.0	2711.7	600
1440 min Summer	4.880	0.0	2948.4	852
2160 min Summer	3.561	0.0	3245.1	1208
2880 min Summer	2.861	0.0	3473.9	1552
4320 min Summer	2.122	0.0	3855.8	2244
5760 min Summer	1.731	0.0	4209.6	2944
7200 min Summer	1.485	0.0	4513.8	3672
8640 min Summer	1.315	0.0	4793.0	4408
10080 min Summer	1.190	0.0	5051.7	5144
15 min Winter	137.991	0.0	953.1	17
30 min Winter	91.711	0.0	1272.9	32

Waterco Ltd		Page 2
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ	13809-Weathercock Hill Farm Garswood 1 in 100 year plus 40% CC	
Date 19/04/2021 File 13809-1 in 100 year +40...	Designed by JR Checked by AW	
XP Solutions	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	9.887	0.887	61.4	1508.4	Flood Risk
120 min Winter	9.973	0.973	61.4	1653.7	Flood Risk
180 min Winter	9.996	0.996	61.4	1693.9	Flood Risk
240 min Winter	9.994	0.994	61.4	1690.1	Flood Risk
360 min Winter	9.969	0.969	61.4	1646.5	Flood Risk
480 min Winter	9.933	0.933	61.4	1585.6	Flood Risk
600 min Winter	9.888	0.888	61.4	1510.3	Flood Risk
720 min Winter	9.839	0.839	61.4	1426.7	Flood Risk
960 min Winter	9.726	0.726	61.4	1234.2	Flood Risk
1440 min Winter	9.531	0.531	61.4	902.6	O K
2160 min Winter	9.347	0.347	60.2	589.8	O K
2880 min Winter	9.278	0.278	54.1	472.3	O K
4320 min Winter	9.227	0.227	41.3	385.3	O K
5760 min Winter	9.199	0.199	34.0	338.8	O K
7200 min Winter	9.182	0.182	29.3	308.7	O K
8640 min Winter	9.169	0.169	26.0	287.2	O K
10080 min Winter	9.159	0.159	23.6	270.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	58.232	0.0	1643.5	60
120 min Winter	34.279	0.0	1935.8	118
180 min Winter	25.097	0.0	2126.4	174
240 min Winter	20.091	0.0	2269.9	226
360 min Winter	14.646	0.0	2482.4	282
480 min Winter	11.674	0.0	2638.2	360
600 min Winter	9.781	0.0	2762.9	436
720 min Winter	8.461	0.0	2867.5	512
960 min Winter	6.724	0.0	3038.2	654
1440 min Winter	4.880	0.0	3304.5	896
2160 min Winter	3.561	0.0	3635.0	1232
2880 min Winter	2.861	0.0	3891.6	1532
4320 min Winter	2.122	0.0	4321.2	2248
5760 min Winter	1.731	0.0	4714.9	2992
7200 min Winter	1.485	0.0	5055.8	3680
8640 min Winter	1.315	0.0	5369.2	4416
10080 min Winter	1.190	0.0	5661.3	5144

Waterco Ltd		Page 3
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ	13809-Weathercock Hill Farm Garswood 1 in 100 year plus 40% CC	
Date 19/04/2021 File 13809-1 in 100 year +40...	Designed by JR Checked by AW	
XP Solutions	Source Control 2020.1.3	


Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 355151 399944 SJ 55151 99944
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 3.379

Time (mins)		Area
From:	To:	(ha)
0	3	3.379

Waterco Ltd		Page 4
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ	13809-Weathercock Hill Farm Garswood 1 in 100 year plus 40% CC	
Date 19/04/2021 File 13809-1 in 100 year +40...	Designed by JR Checked by AW	
XP Solutions Source Control 2020.1.3		

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1700.0	1.000	1700.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0321-6140-1000-6140
Design Head (m)	1.000
Design Flow (l/s)	61.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	321
Invert Level (m)	8.995
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	61.4
Flush-Flo™	0.477	61.4
Kick-Flo®	0.804	55.3
Mean Flow over Head Range	-	48.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.6	1.200	67.1	3.000	104.6	7.000	158.2
0.200	32.8	1.400	72.2	3.500	112.8	7.500	163.7
0.300	57.8	1.600	77.1	4.000	120.4	8.000	168.9
0.400	61.0	1.800	81.6	4.500	127.5	8.500	174.0
0.500	61.4	2.000	85.9	5.000	134.2	9.000	179.0
0.600	60.6	2.200	90.0	5.500	140.6	9.500	183.8
0.800	55.5	2.400	93.8	6.000	146.7		
1.000	61.4	2.600	97.6	6.500	152.6		

Eden Court
Lon Parcwr Business Park
Denbighshire LL15 1NJ

13809-Weathercock Hill Farm
Garswood
1 in 100 year plus 40% CC



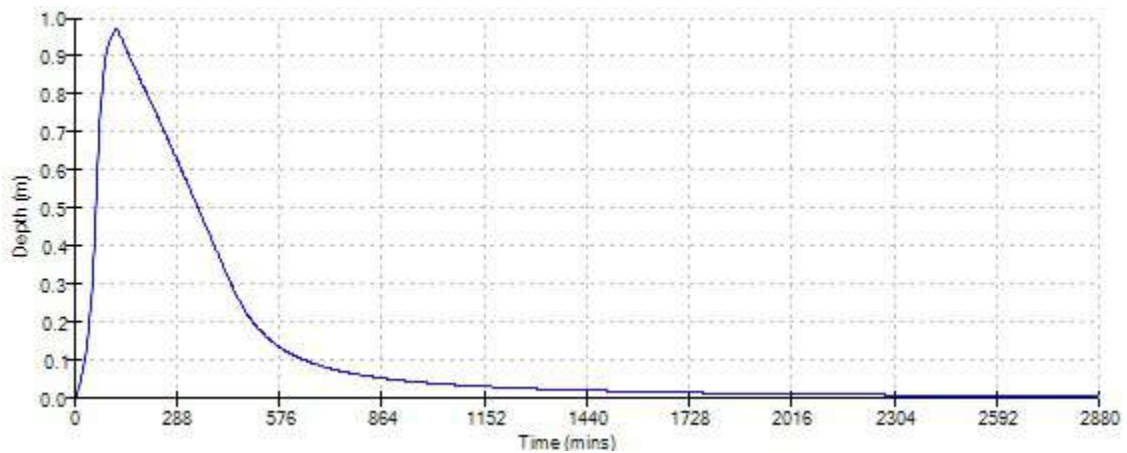
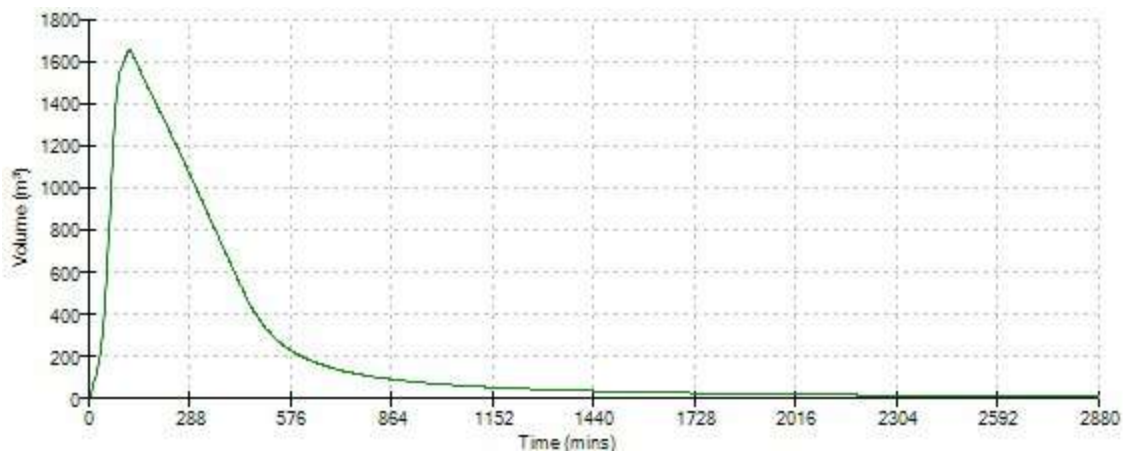
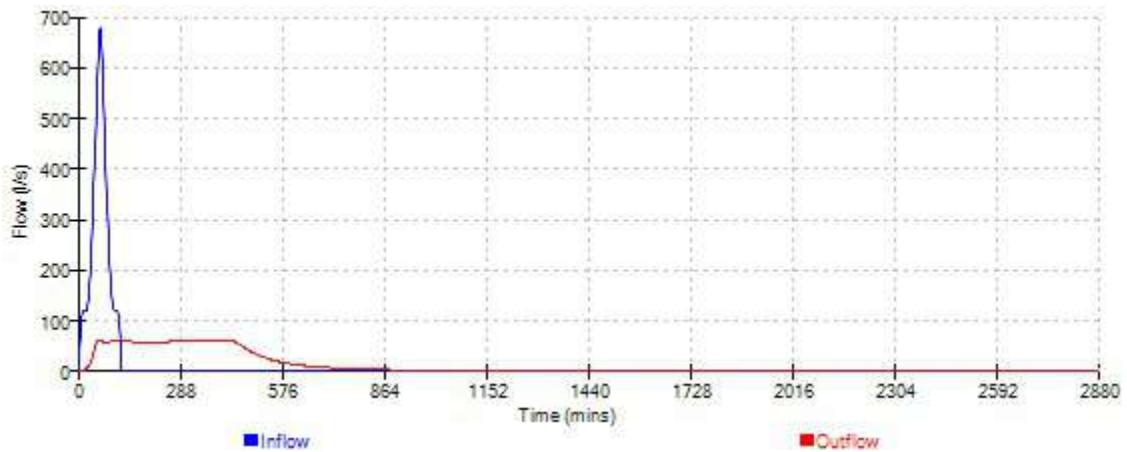
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Checked by AW

XP Solutions

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Event: 120 min Winter



Eden Court
Lon Parcwr Business Park
Denbighshire LL15 1NJ

13809-Weathercock Hill Farm
Garswood
1 in 100 year plus 40% CC

Date 19/04/2021
File 13809-1 in 100 year +40...

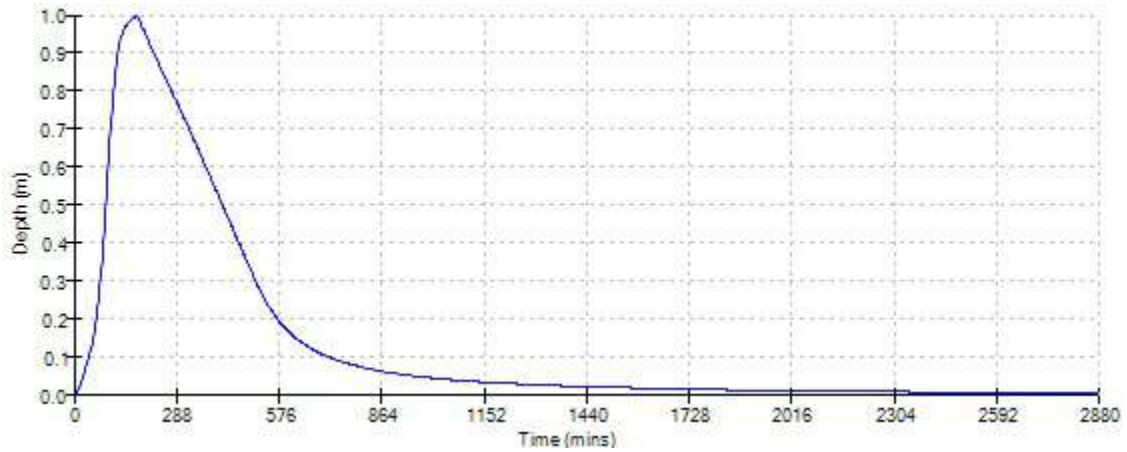
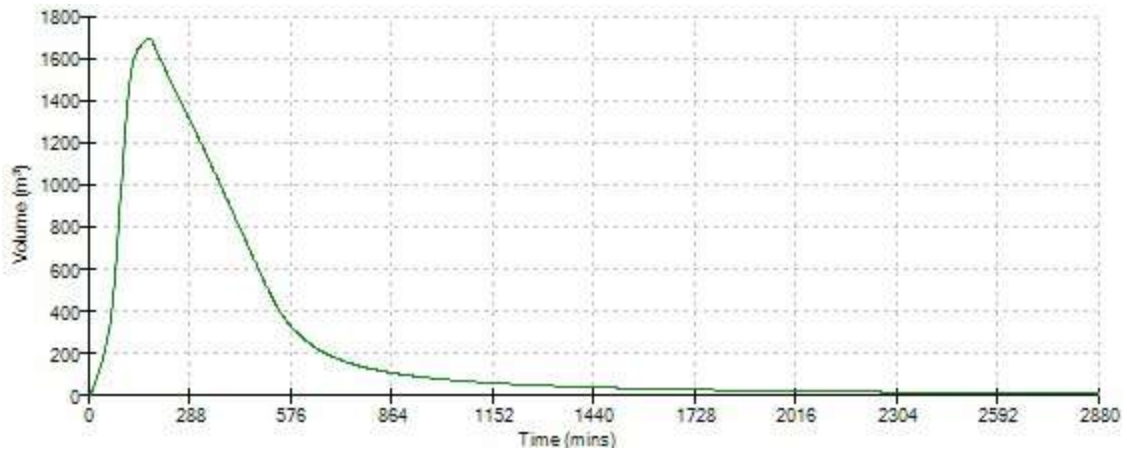
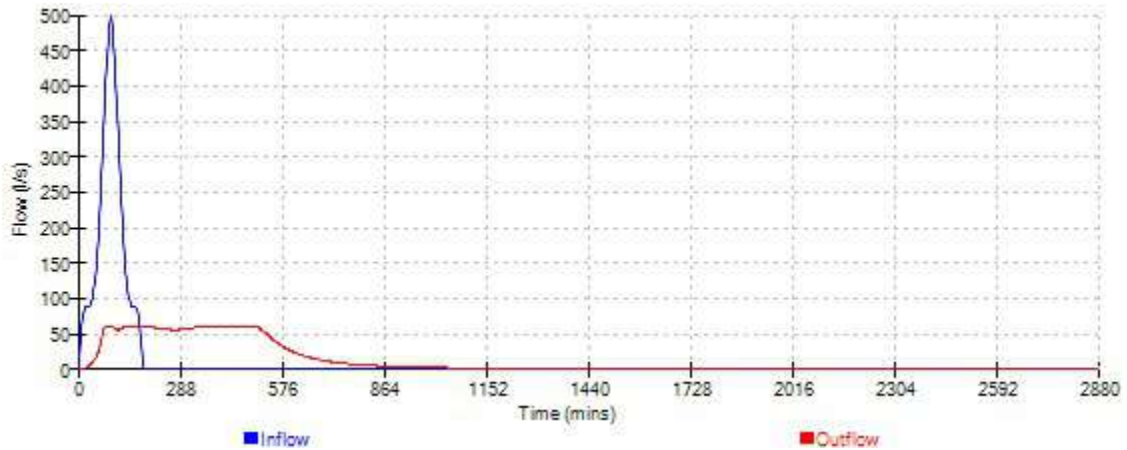
Designed by JR
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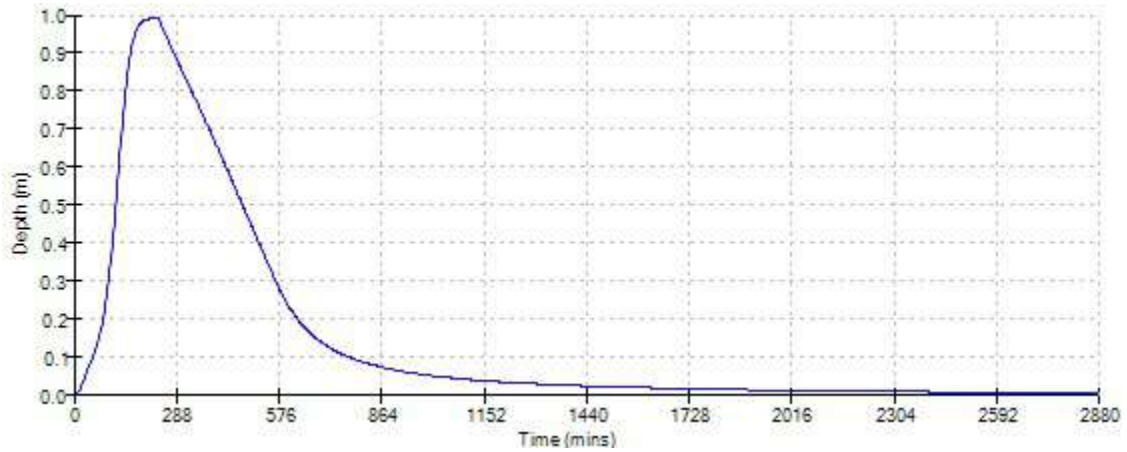
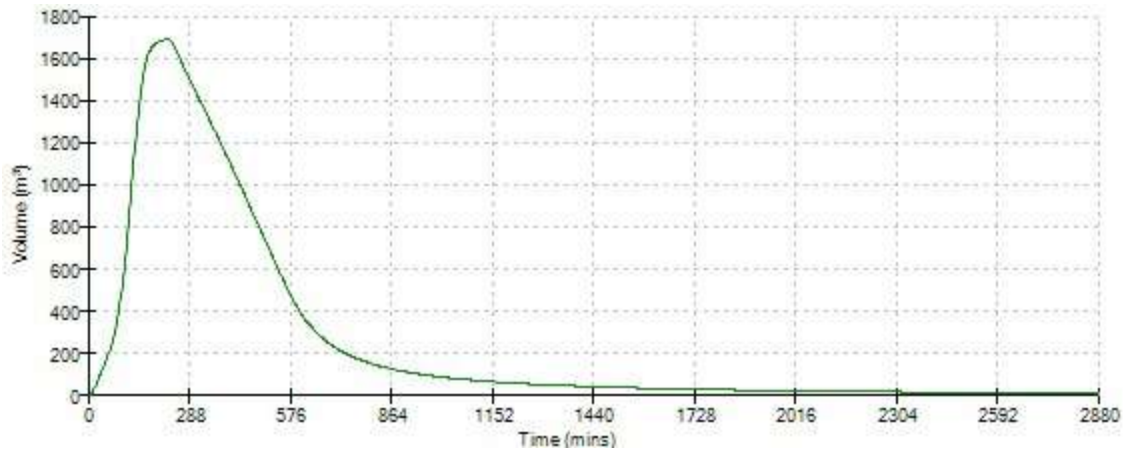
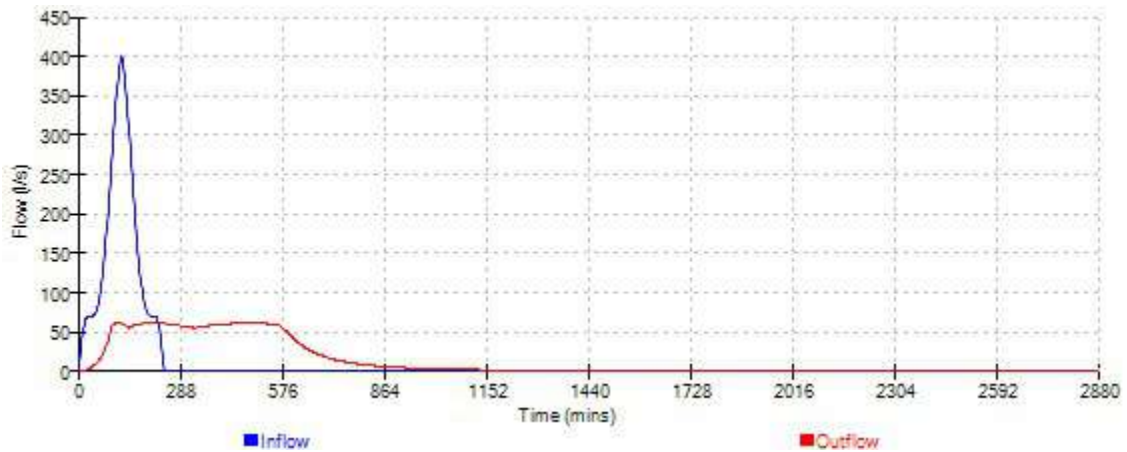
Source Control 2020.1.3

Event: 180 min Winter



Waterco Ltd		Page 7
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ	13809-Weathercock Hill Farm Garswood 1 in 100 year plus 40% CC	
Date 19/04/2021 File 13809-1 in 100 year +40...	Designed by JR Checked by AW	
XP Solutions	Source Control 2020.1.3	

Event: 240 min Winter



Appendix J SuDS Maintenance Schedules

Operation and Maintenance Requirements for Ponds and Wetlands

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season), or as required
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage, and / or physical damage.	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options.	Half yearly
	Check any mechanical devices e.g. penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water’s edge to a minimum of 1m above water level	Annually
	Remove sediment from any forebay	Every 1 – 5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, e.g. 25-50 years
Remedial actions	Repair erosion or other damage	As required
	Replant where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate of Inlets, outlets and overflows	As required

Ref. Table 23.1 CIRIA C753 ‘The SuDS Manual’

The maintenance requirements detailed above are to be undertaken by the site owner.

Name :

Position :

Date :

Signed on behalf of the site owner :

Operation and Maintenance Requirements for Swale

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as Required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swales treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oil or petrol residues using safe standard practices	As required

Ref. Table 17.1 CIRIA C753 ‘The SuDS Manual’

The maintenance requirements detailed above are to be undertaken by the site owner.

Name :

Position :

Date :

Signed on behalf of the site owner :

Operation and Maintenance Requirements for Permeable Paving

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer’s recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and move contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level or the paving	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and / or weed growth – if required, take remedial action	Three-monthly, 48hr after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Ref. Table 20.15, CIRIA C753 ‘The SuDS Manual’

The maintenance requirements detailed above are to be undertaken by the site owner.

Name : _____

Position : _____

Date : _____

Signed on behalf of the site owner : _____

Appendix K CDRA

Project:	Weathercock Hill Farm	Project No:	13809
Client:	Persimmon Homes Ltd		
Report Reference:	13809-FRA + DRA-01		

Prepared by:	Jessica Roberts BSc (Hons)	Date:	19/04/2021
Checked by:	Aled Williams BSc (Hons) MCIWEM	Date:	27/04/2021
Reviewed by:	Victoria Griffin BSc (Hon) MSc MEnvSc Cenv	Date:	27/04/2021

Requirement:

The Construction (Design and Management) Regulations 2015 (CDM 2015) place an obligation on the Designer to take all reasonable steps to provide, with the design, sufficient information about the design, construction or maintenance of the structure, to adequately assist the client, other designers and contractors to comply with their duties under CDM. The Designer has undertaken this assessment to identify any extra-ordinary risks, or those that would not be expected on this particular project by an experienced and competent Contractor. The aim is to avoid needless paperwork and bureaucracy and ensure the assessment is project specific, relevant and proportionate to the risk.

DRA Summary

Each of the following risk areas has been considered using the question below. Is a risk present which is considered to be **extra-ordinary or unexpected** in this instance?

If **YES** - A detailed risk assessment is required at design stage

If **UNKNOWN** - Insufficient information has been provided at concept design stage and the risks are unknown. Further consideration must be given at design stage(s)

If **NO** - No further action is required.

Hazard Ref.	Risk Areas	YES, UNKNOWN or NO	Comments
1	Ground Conditions	Unknown	Pennine coal measures - may be in site coal mining area
2	Hazardous Environment	Unknown	
3	Existing Working Environment	Unknown	
4	Existing Services	Unknown	Rivington Aqueduct (water main) crosses the site.
5	Proximity to Other Structure(s)	Unknown	
6	Near Waterbody / flood risk	Unknown	Potential surface water flood risk during heavy rainfall
7	Proximity to Other Activities	Unknown	
8	Sequence of Construction	Unknown	
9	Access	Unknown	
10	Interfaces	Unknown	
11	Confined Space Working	Unknown	
12	Maintenance Considerations	Unknown	
13	Working at Height	Unknown	
14	Steep Slopes	No	
15	Demolition / Refurbishment / Repair	Unknown	
16	Welfare	Unknown	
17	Occupational Health	Unknown	
18	Environmental Issues	Unknown	
19	Other Significant Hazards not Identified Above	Unknown	
20	Residual Risk to Future Users	Unknown	